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EDITORIAL

Atmanirbhar' in Defence: Making the Nation self-reliant & stronger

Prime Minister's clarion call for Atmanirbhar Bharat is to establish a self-reliant India by producing in India what we need instead of importing. This is significant for defense and aerospace manufacturing industries. Although India has established world-class infrastructure and facilities in public and private sector including in the SMEs, India is still one of the major importers of defense equipments. More than 70% (in value) of India's defense equipments are still imported. Continuing along this track would make the domestic defense industry weak and adversely affect our defense capability. Indian defense PSUs, private sector corporates and SMEs must endeavour to work in partnership to manufacture, develop and manufacture world-class equipments in active collaborations with DRDO labs and other national labs. The feasibility has been amply demonstrated through some of the national projects. However, the policy and practice of MoD and user organisations of placing piece meal order in small batches do not make it attractive for private industries to invest and participate and also such manufacturing will be economically unviable and product cost will go up. Create competition rather than synergy between the defense PSUs and private sector corporates, will deprive the nation for making a strong invited approach to establishing self-reliance. The divisive policy will drive the Indian industries to seek foreign collaboration to compete with each other and ultimate will be foreign OEM and not India.

The pro-active defense procurement policy with emphasis on 'Made in India' and 'Make in India' must encourage strategic partnership between Indian defense PSUs and private corporates with active participation of SMEs and see collaboration with foreign OEMs only in case it is absolutely essential and with MOD approval. Government has recently banned import of over hundred defense equipments. More items can be added to this list, if industries can provide detailed information of items developed and approved by users / certifying agencies. However some of the user organisations are still resorting to global tenders for items which are already developed indigenously and certified. This is clearly against the published DPP which prescribes domestic tenders only for such items.

Another issue is that the orders for indigenously developed products are being placed by the armed forces / government agencies in small batches affecting economic viability for production and not being attractive for partnership with private industries which need large orders and long-term commitment. Indian private industries particularly SMEs are not given any financial support in the development of equipments. They are also denied the IPR and even sharing of IPR for items they have participated in development. The entire documentation and processes for the development and manufacture are to be submitted for getting the items qualified / certified, without any assurance of confidentiality that these will not reach competitors. Also there is no assurance of giving long term orders. Industries will have to take up these issues with MoD, the procuring organisations and DRDO.Affirmative action with teamwork and nationalism from all concerned is required to make the 'Atmanirbhar Bharat' successful with respect to defense equipment manufacture. Success of this program will make India more self-reliant and stronger to tackle threats and aggression from the enemies.

Dr C G Krishnadas Nair
Honorary President, SIATI

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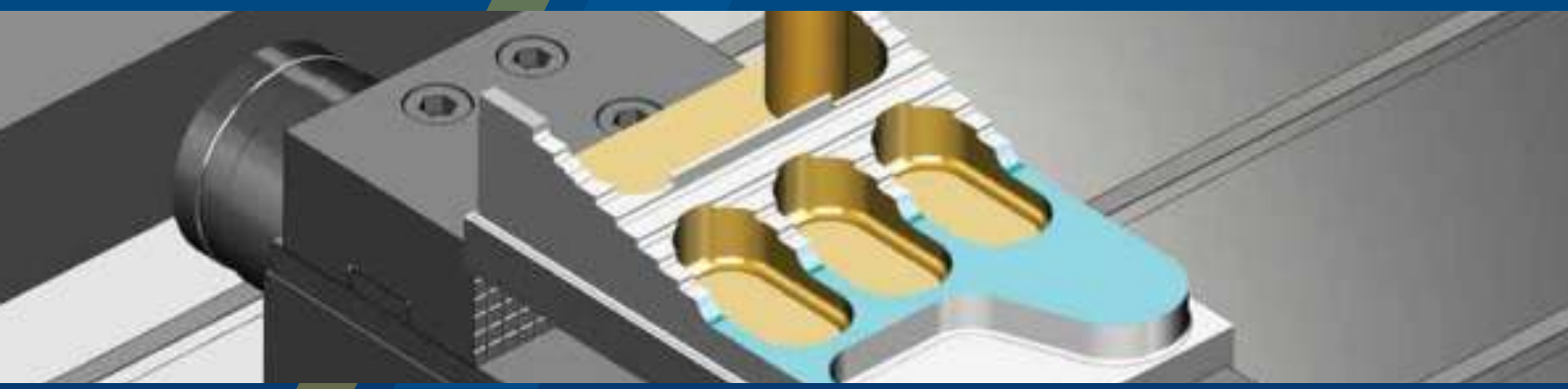

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Rafale Formally Inducted into Indian Air Force

Rafale Fighter Aircraft has been formally inducted into the Indian Air Force (IAF). Defence Minister Rajnath Singh and French Defence Minister Florence Parly were present at the function at Air Force Station, Ambala.

Speaking on the occasion, Rajnath Singh said the induction of Rafale was historic moment and a very important milestone in the history of the IAF. He said, the Rafale deal was a game changer for India's national security and its induction is a strong message for the world and especially for those who challenge India's sovereignty. Rajnath Singh reiterated the resolve of not compromising India's sovereignty and territorial integrity under any circumstances and the country's determination to make all possible preparations for it. "The intentions of military are as strong as it can be" he said. He also said "strengthening our defence is aimed at achieving international peace and stability and we do not want

The Chief of the Air Staff, Air Chief Marshal R.K.S. Bhadauria, Air Marshal B. Suresh and the Air Officer Commanding Air Force Station Ambala along with the pilots of the first Rafale aircraft that had arrived at Air Force Station Ambala, in Haryana on July 29, 2020.

to take any step that can endanger international peace. We have the same expectation of our neighbours and other countries of the world."

Talking about the priorities of Prime Minister Narendra Modi, Defence Minister said national security has been a major priority and it is the result of his vision that we are seeing today despite many obstacles that came in the way.

Terming that the Rafale induction reflected close India-France strategic relations, the minister said "we have cooperated closely in a number of areas to enhance our defence cooperation. As part of the transfer of technology agreement, 6 Scorpene submarines are being built at the Mazagaon Docks. On the basis of this partnership, the first submarine,

Defence Minister Rajnath Singh along with the Minister of Armed Forces of the French Republic,. Florence Parly during the formal induction ceremony of Rafale aircraft, at 17 Squadron of Indian Air Force Station, in Ambala on September 10, 2020. The Chief of Defence Staff (CDS), General Bipin Rawat, the Chief of the Air Staff, Air Chief Marshal R.K.S. Bhadauria and the Defence Secretary, Dr. Ajay Kumar are also seen.

INS Kalvari was commissioned in 2017."

He also highlighted the Indo-French cooperation in dealing with common challenges like maritime security and piracy in the Indo-Pacific region and IOR.

Rajnath Singh also pitched for French investments in the Indian defence manufacturing sector. He said in response to the call for 'Self-reliant initiative' by Prime Minister, Narendra Modi, many policy reforms have been initiated such as manufacturing of defence equipment under the strategic-Partnership model, enhancing FDI up to 74% by automatic route, establishment of two defence corridors in Uttar Pradesh and Tamil Nadu and reforms in Offsets. "I am confident that French defence Industries will take advantage of this and France will continue to be our partner in our journey of indigenization", he said.

The minister congratulated the IAF personnel for the swift and decisive action taken by them near LAC recently. He said the rapid deployment of IAF assets at forward bases created a trust that our Air Force was fully prepared to meet its operational obligations. Shri Singh also lauded the contribution of IAF to the country's efforts during Covid-19 pandemic.

The French Minister Florence Parly said, induction of Rafale into the IAF is a symbol of strong ties between the two countries which is rock solid and time tested. She said now, in military terms, India will acquire a world class capability that will give New Delhi an incredible sovereignty and in strategic terms it will give India an edge over the entire region to defend itself. She also assured timely delivery of the 31 remaining aircrafts. Florence Parly also said France is fully committed to the Make in India initiative which has been a reality for French industry for several years particularly in defence sector like in submarines.

Chief of Defence Staff General Bipin Rawat, Chief of the Air Staff Air Chief Marshal RKS Bhadauria, Defence Secretary Dr Ajay Kumar, Secretary (Defence Production) Raj Kumar, Secretary Department of Defence Research & Development and Chairman DRDO, Dr G Satheesh Reddy, along with other senior officers of Ministry of Defence and Armed Forces witnessed the event. The French delegation included Emmanuel Lenain, Ambassador of France to India, Air General Eric Autellet, Vice Chief of the Air Staff of the French Air Force and other senior officials. A large delegation of senior functionaries of French Defence Industries which included Eric Trappier Chairman and Chief Executive of Dassault Aviation and Eric Beranger, CEO, MBDA were present during the ceremony.

The first five Rafale aircraft which arrived at Air Force Station, Ambala from France on 27th July 2020, would be part of 17 Squadron, the "Golden Arrows".

Before the ceremonial unveiling of the Rafale, a traditional 'Sarva Dharma Puja' was performed. There was an Air Display by Rafale and Tejas aircraft as well as by 'Sarang Aerobatic Team, followed by a traditional water cannon salute to the Rafale aircraft. After the ceremonial events the Indian and French delegations also had a bilateral meeting.

Defence Minister Rajnath Singh along with the French Defence Minister. Florence Parly in a group photograph in-front of Rafale aircraft at its formal induction ceremony, at 17 Squadron of Indian Air Force Station, in Ambala. The Chief of Defence Staff (CDS), General Bipin Rawat, the Chief of the Air Staff, Air Chief Marshal R.K.S. Bhadauria and the Defence Secretary, Dr. Ajay Kumar are also seen.

A Strong Defence Industry to Keep off External Threats

India has been a major importer of defence equipment since it became a free country. However, after the Narenda Modi government came to power in 2014, the country is launching programmes for promoting domestic manufacturing in the defence sector and protecting MSMEs. The private industries too are being roped in to achieve self-sufficiency in defence.

Ever since Independence, India has been a major buyer of armaments and defence equipment. In fact, according to a recent study by Stockholm International Peace Research Institute, the country is the world's third-biggest customer of military equipment after the US and China.

Earlier, India depended heavily on the former Soviet Union for its defence needs. Later, it turned to other countries like the US, Israel and European nations to diversify the purchases. Recently, Indian Prime Minister Narendra Modi signed a deal to purchase advanced military equipment worth US Dollars 3 billion with US President Donald Trump.

However, things started changing after Modi came to power in 2014 and India has been launching programmes such as 'Make in India' promoting domestic manufacturing in the defence as well as other sectors and protecting MSMEs in the country. For instance, the Defence Production Policy of 2018 has set a goal for India to become one among the top five global producers in aerospace and defence by 2025. The latest among these initiatives is the 'Atmanirbhar Bharat' campaign announced by the Prime Minister and draft Defence Production and Export Promotion Policy (DPEPP) 2020. Two defence industrial corridors too are taking shape.

Support for private sector

These programmes aim to boost India's self-reliance in the key sector of defence, for which the government is also keen to give a fillip to the private industries. There is a realization in the country now that private firms should be supported to develop and innovate new defence hardware. Considering that this could be achieved by foreign collaboration, the Indian government has decided to allow 74 per cent foreign direct investment (FDI) in defence production through the automatic route.

In India, FDI is allowed through two routes, automatic and government. While in the former route, companies don't require approval from the government, in the latter, they need the Centre's approval.

Speaking at a webinar held as part of the Atmanirbhar Bharat Defence Industry Outreach, the Prime Minister said, "Our goal is to increase production in India, develop new technology in the country, and maximise expansion of private sector in defence production."

"Many important steps have been taken in this direction," Modi added. To give a fillip to the domestic industry, the Centre banned the import of 101 military items. The list would soon be extended to more equipment, said the Indian premier.

"We cannot achieve the goal of Atmanirbhar Bharat without giving level playing field to the private sector," said India's Defence Minister Rajnath Singh.

Regarding the Strategic Procurement (SP) model, an official said that the procurements under the SP policy were open for both the private and the public sector. "The SP was originally meant for the private sector," he added.

Another official said that any foreign company registered in India, even if it was a subsidiary of a foreign company, would be considered an Indian vendor

"The government's commitment to self-sufficiency in defence production is not limited to talks or papers," Modi said.

"The government's efforts are being directed to ensure increase in defence production, the development of new technology and the assignment of significant roles to private players," the Prime Minister stressed.

He said that India had immense potential for defence production. "For many years, India has been one of the biggest defence importers. An ecosystem of defence manufacturing has been established over 100 years but unfortunately, this sector did not get the required attention," he explained.

Another major step to promote domestic industry is the setting up of two defence corridors. "The government is speeding up work on the defence corridors. State-of-the-art infrastructure is coming up in collaboration with the governments of Uttar Pradesh and Tamil Nadu. An investment target of Rs 20,000 crore has been set in the coming five years for the corridors," Modi elaborated.

In order to overcome the economic setback created by the coronavirus pandemic, the Prime Minister had announced a Rs 20 lakh-crore financial package, which aimed to create a self-reliant India based on the five crucial pillars of economy, infrastructure, system, demography and demand.

Boosting exports

Meanwhile, India has set an annual target of US Dollars 5 billion by 2025 for defence exports. "The country has the capability to become a reliable weapons supplier to friendly nations and it will consolidate its position as the net security provider in the Indian Ocean region," said the Prime Minister.

To achieve this goal, apart from

allowing 74 per cent FDI in defence through the automatic route, the Central government is engaged in the process of corporatisation of the Ordnance Factory Board (OFB). According to Rajnath Singh, the corporatisation of the OFB would be completed within a year. "We have earmarked a portion of our defence budget for procurement only from the domestic industry. For the current year, the amount will be Rs 52,000 crore," he said.

Moreover, for developing new indigenous technologies, the government has launched initiatives to ensure a simplified licensing field, level playing field and simplifying exports.

At the same time, Chief of the Defence Staff (CDS) Gen. Bipin Rawat said that India's efforts to promote defence exports have started to yield results. "We are receiving requests from various countries. Our radars as well as artillery support systems are much in demand," he said.

The government has also formulated a draft Defence Production and Export Promotion Policy (DPEPP) 2020 with the aim of achieving a manufacturing turnover of US Dollars 25 billion, which is equivalent to Rs 1,75,000 crore, including exports of US Dollars 5 billion in aerospace and defence goods and services by 2025. The draft DPEPP has also set a target to double the procurement from domestic industry within the overall defence procurement from the current Rs 70,000 crore to Rs 1,40,000 crore by 2025.

"The government has undertaken

reforms in the toughest sectors like Intellectual Property (IP), taxation, insolvency and bankruptcy and even in space and atomic energy. For foreign Original Equipment Manufacturers also, producing in India will be the best option," said the Prime Minister.

Regarding the ban imports of 101 defence items, Gen Rawat said that by early 2021 a second list with more technologically advanced equipment would be released. "The number of items on the next list will be even more than the present one and the lists are also will be increased," he said.

The CDS also said that if the aerospace industry can become self-sufficient, including aerospace in the negative list will be a big achievement.

Israel model

Several defence analysts have suggested that Israel's defence policy was ideal to follow. Israel has developed high technology products for its self-protection and after meeting domestic requirements, launched programmes to commercialize the items. This policy has not only enabled the country to earn foreign exchange but also improved its position among the powerful nations of the world.

Similarly, a strong defence base in the country would enable India too to issue a warning to its enemies, especially in the neighbourhood, and prevent interference from them. ■

India and Japan Sign Agreement on Supplies and Services between Forces

The Defence Secretary, Dr. Ajay Kumar with the Ambassador of Japan, Suzuki Satoshi during the signing of the agreement between the two countries on Reciprocal Provision of Supplies and Services between the Armed Forces of India and The Self-Defense Forces of Japan, in New Delhi .

India and Japan signed an agreement concerning Reciprocal Provision of Supplies and Services between the Armed Forces of India and The Self-Defense Forces of Japan. The agreement was signed by Defence Secretary Dr Ajay Kumar and Ambassador of Japan Suzuki Satoshi.

This agreement establishes the enabling framework for closer cooperation between the Armed Forces of India and Japan in reciprocal provision of supplies and services while engaged in bilateral training activities, United Nations Peacekeeping Operations, Humanitarian International Relief and other mutually agreed activities.

The agreement will also enhance the interoperability between the Armed Force of India and Japan thereby further increasing the bilateral defence engagements under the Special Strategic & Global Partnership between the two countries.

CAE awarded Contract for USSOCOM Global Situational Awareness Program

CAE announced that CAE USA's wholly-owned subsidiary, CAE USA Mission Solutions Inc. (MSI), has been awarded an Other Transactional Authority (OTA) contract by United States Special Operations Command (USSOCOM) to support the Special Operations Forces (SOF) Global Situational Awareness initiative.

Under a program called Mission Command, USSOCOM sought industry innovation to accelerate the application of commercially derived software development into deployable mission support capabilities. The scalable next-generation Mission Command system is intended to enhance the SOF enterprise through the creation of a Common Operational Picture (COP).

The OTA contract allows U.S. Department of Defense agencies to carry out prototype and research and development projects under commercial industry standards and best practices. CAE USA MSI will now progress to the next phases of the Mission Command program by developing a prototype that leverages a synthetic environment to provide global situational awareness. The synthetic environment will support data/track object management, information integration, standards-based interoperability, automated production and visualization to fuse data into a COP that provides next generation command and control capabilities.

"CAE USA is leveraging our modelling and simulation expertise to translate the physical world into synthetic environments that enhance planning and operational mission support for our defense forces," said Ray Duquette, President and General Manager, CAE USA. "Synthetic environments can be a powerful tool for course of action analysis and decision making that can help enhance readiness, interoperability and shared situational awareness between collective, joint and coalition forces."

Selection for this OTA contract continues the mission of CAE USA MSI to support the creation and integration of innovative mission systems solutions for USSOCOM. Last year, CAE USA MSI was awarded the Open Geospatial Consortium Common Database (OGC CDB) rapid prototyping contract by USSOCOM to develop and enhance data visualization and mission rehearsal for global SOF forces. The OGC CDB establishes greater interoperability in use of geospatial data through development of geospatial standards and interoperable solutions.

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UPDIC: A Giant Stride in Aerospace & Defence

Yogi Adityanath
Chief Minister of Uttar Pradesh

The Uttar Pradesh Defence Industrial Corridor (UPDIC) is an aspirational project that intends to reduce foreign dependency of Indian Aerospace & Defence Sector, says the state government. UPDIC is expected to promote indigenisation and support the 'Make in India' initiative, helping meet Aerospace and Defence equipment requirements worth over US Dollars 250 billion by 2025.

With the aim of achieving self-reliance in the Aerospace and Defence (A&D) sector, the Government of India announced the setting up of two Defence Industrial Corridors, one in Uttar Pradesh and the other in Tamil Nadu, in the Union Budget of 2018-19. The country's requirements in A&D are estimated to be over US Dollars 250 billion by 2025. The items needed range from military aircraft, submarines, helicopters, land systems to weapons and sensors and the defence industrial corridors are intended to tap this big opportunity.

Uttar Pradesh is the fourth largest state and the third largest economy in the country. With a population of more than 200 million, UP has the highest number of available labour force and is one of the top five manufacturing states in India. The state also ranks first in terms of number of MSMEs in India.

According to the state government, the Uttar Pradesh Defence Industrial Corridor (UPDIC) is an aspirational project that intends to reduce foreign dependency of Indian Aerospace & Defence Sector. It received an encouraging start with the announcement of investments worth over Rs 3,700 crore in defence production at a meeting held at Aligarh in August 2018. The Uttar Pradesh Expressways Industrial Development Authority (UPEIDA) was made the nodal agency to execute the project in conjunction with various other state agencies.

The UP government is establishing Common Facility Centres (CFC), Centres of Excellence (CoE) and Skill Development Centres to provide best practices and facilitate research and development as well as skill development. In short, the corridor not only targets at setting up of manufacturing hubs but also aims at generating employment opportunities to cater to the most populous state in the country.

Nodes planned

The UPDIC was initially planned across six nodes in the state, Lucknow, Kanpur, Jhansi, Agra Aligarh, Chitrakoot, which spread across Central, East, West region of Uttar Pradesh and along the Golden Quadrilateral connecting Delhi – Kolkata supported by networks of the following expressways: Yamuna Expressway; Agra – Lucknow Expressway; Purvanchal Expressway; Bundelkhand Expressway; Gorakhpur Link Expressway and Ganga Expressway.

Leading academic institutions IIT Kanpur and IIT Banaras Hindu University Varanasi were approved

by Government of Uttar Pradesh for establishment of Centre of Excellence (CoE) related with Defence Industrial Corridor and allotted significant amounts.

Meanwhile, the Uttar Pradesh Defence and Aerospace Unit and Employment Promotion Policy (First Amendment) 2019 was published by Government of Uttar Pradesh with the objective of attracting investments in UPDIC. Guidelines/procedures for allotment of industrial plots in the Defence Corridor were also published for seamless land allotment procedures.

Numerous MoUs were subsequently signed between UPEIDA and various companies to establish manufacturing units at the nodes for UPDIC and land allotment also was initiated for Aligarh and Kanpur nodes.

Signing of an MoU between UPEDIA and Indian Navy is in the pipeline to facilitate identifying problem areas, finding solutions and manufacturing through Indian Industry. There is also a proposal to establish a Defence Park as a joint venture of UPEIDA and IIT, Kanpur on a 30-acre land in Shivli near the IIT. Another proposal of CFC at Lucknow is being initiated, to carry out prototyping, designing, skilling and incubation.

The first major priority of the UP Government is the creation of an industry-ready land bank for setting up of infrastructure for the A&D industries. For this, around 5071.19 hectares of land is proposed to be acquired in a phased manner for the corridor.

Prime Minister Narendra Modi, Defence Minister Rajnath Singh and UP Chief Minister Yogi Adityanath have played a major role in the smooth roll out of the UPDIC project. While the Prime Minister represents the Varanasi Lok Sabha constituency in Uttar Pradesh, Rajnath Singh is a former Chief Minister of the state who won from the capital Lucknow in the 2019 General Election. Meanwhile, Yogi Adityanath is a veteran administrator who is keen to lead the state on the path of development.

Land acquisitions

Meanwhile, the UP government has begun acquiring land for the corridor. Announced by Prime Minister Modi at the UP Investors Summit in February 2018, UPDIC is estimated to attract investments of Rs 20,000 crore in the arid Bundelkhand region and create employment for 2.5 lakh people.

Land for the flagship project is being acquired in two phases. "As much as 3,788 hectares of land is to be acquired across four nodes as part of Phase I, out of which over 1,455 hectares has been identified in Jhansi, Kanpur, Chitrakoot and Aligarh. Of this, around 1,200 hectares has already been acquired, mainly in Jhansi, Aligarh and Chitrakoot," said a top official of UPEIDA.

Even though Lucknow, Jhansi, Chitrakoot, Aligarh, Kanpur and Agra were initially proposed as the six nodes, the good response to UPDIC led the UP government notify another three nodes for investment: Meerut, Ghaziabad and Gautam Buddha Nagar. According to officials, the project is being implemented in Bundelkhand given the availability of cheap land and the existence of a strong ancillary base in the region.

"UPDIC will promote indigenisation and support the 'Make in India' initiative, helping meet equipment requirements worth over US Dollars 250 billion by 2025. It would also promote ancillarisation and development of MSMEs for the A&D sector, making UP a preferred destination for the purpose and boosting India's defence exports," said an official.

Rajnath Singh
Defence Minister of India

The potential of UPDIC was recognized by investors at the DefExpo 2020 in Lucknow, where 23 companies signed MoUs worth Rs 50,000 crore with the state government for investment in the corridor. Ancor Research Labs became the first investor in the corridor at DefExpo and was allotted 25 acres of land in the Aligarh node to create high-end defence testing facilities and manufacture defence grade communication systems.

Speaking after presenting the state's budget for 2020-21, Chief Minister Yogi Adityanath said UPDIC would help turn Uttar Pradesh into a US Dollars 1-trillion economy by 2024. The government would soon create a land bank of 25,000 acres to facilitate setting up of industries on the corridor, he said. "UP's aim is to become a net exporter. In fact, even if half of the MoUs that were signed at the DefExpo are realised, we will be able to generate employment for 2.5 lakh people," said the Chief Minister.

The corridor has several avenues for investments, including defence parks at Jhansi, Agra, and Kanpur; aerospace parks at Lucknow, Kanpur, and Agra; leather and textile hubs at Agra; and engineering/electronics manufacturing hubs at Agra, Kanpur, Gautam Buddha Nagar and Ghaziabad.

The state government has also offered major incentives in its Defence & Aerospace Policy 2018 to attract investment, including reimbursement of 25 per cent of land cost, transportation subsidy, and reimbursement of 75 per cent of the cost of technology transfer to anchor units.

A shot in the Arm for India's Defence Industry

As part of raising its guard against external threats, the Government of India has decided to give a boost to the country's defence manufacturing sector. Apart from banning the import of 101 defence-related products which is intended to promote domestic production, the DRDO has prepared a list of 108 military systems and subsystems for India's defence industry to design, develop and manufacture.

The face-off with China on the border and the continuing skirmishes with Pakistan have reminded India of the need to be constantly prepared for any eventuality. These incidents have also spurred the Indian government to launch a series of crucial measures to enhance the defence preparedness of the country.

Among the major initiatives set in motion by the government is the move to ban imports of over 100 items of military equipment with the aim of making the nation more self-reliant in weapons manufacturing. This step is also a part of the programme announced by Prime Minister Narendra Modi to increase the overall domestic production. According to the Ministry of Defence (MoD), imports of 101 items of military equipment would be banned so that their indigenous production receives a boost. The Prime Minister had earlier issued a call for 'Atmanirbhar Bharat', or a self-reliant nation.

Giving details of the initiative, India's Defence Minister Rajnath Singh said the government is planning to implement the embargo on defence imports in a phased manner from 2020 to 2024. "Our aim is to apprise the Indian defence industry about the anticipated requirements of the Armed Forces so that they are better prepared to realize the goal of indigenization," Singh said in a tweet.

"This is a big step towards self-reliance in defence. This decision will offer a great opportunity to the Indian defence industry to manufacture the items in the negative list by using their own design and development capabilities or adopting the technologies developed by DRDO to meet the requirements of the armed forces," Singh tweeted.

"The promulgation of the list, which will be reviewed and expanded every year as domestic production capacity increases, will allow lead-time to the

Indian industry to prepare itself about the anticipated requirements of the armed forces," said Singh.

India has an unenviable reputation as a top importer of arms and equipment. For instance, the country was the world's second-largest buyer of foreign weapons after Saudi Arabia during the years 2015-19, accounting for 9.2 per cent of the total global arms imports.

Focus on Self-Reliance

Launching the 'Atmanirbhar Bharat' campaign in May 2020, the Prime Minister said the country will stop importing weapons that can be made domestically. "This move can make the economy more self-reliant amid the coronavirus pandemic," he said.

Even though the government has banned outright procurements of the 101 products from abroad, it has allowed Indian public sector and private firms to tie-up with foreign manufacturers to produce them in India. This measure is in the backdrop of the decision to increase the FDI limit from 49 per cent to 74 per cent in the defence production sector through the automatic clearance route. The list of banned items also includes the 123 Tejas light combat aircraft that Indian Air Force (IAF) is planning to induct at a cost of over Rs 85,000 crore. According to the Indian government, this is aimed to ensure that the indigenous content in similar products is increased progressively.

The Defence Minister said 260 deals worth Rs 3.5 lakh crore for items now being banned were contracted for the Indian armed forces between April 2015 and August 2020. After the negative list comes into effect, contracts worth almost Rs 4 lakh crore will be given to the domestic industry in the coming six to seven years. "This will include products worth Rs 1.3 lakh crore for the Army and IAF, and another 1.4 lakh crore for the Navy," said Singh.

Meanwhile, the Ministry of Defence (MoD) has also bifurcated the Rs 1.18 lakh crore capital outlay for 2020-21 between domestic and foreign capital procurement routes. "A separate budget head has been created with an outlay of nearly Rs 52,000 crore for domestic capital procurement in the current financial year," said the Minister.

"All necessary steps will be followed to ensure that timelines for production of equipment as per the negative imports list are met. This will include a coordinated mechanism for hand holding of the industry by the armed forces," he said.

Giving an example, Singh, referring to the wheeled armoured fighting vehicles, said the Army is expected to buy around 200 of them at an approximate cost of over Rs 5,000 crore, with the indicative import embargo date of December 2021. Likewise, the Navy's expected demands for

conventional diesel-electric submarines with the indicative import embargo date of December 2021 would lead to a contract worth around Rs 42,000 crore.

"The negative list was prepared after several rounds of consultations with all stakeholders, including the Army, Navy, IAF, the Defence Research and Development Organisation (DRDO), defence PSUs, Ordnance Factory Board (OFB) and the private industry," said MoD officials. The current and future capabilities of the Indian industry for manufacturing ammunition, weapons, platforms and equipment within the country were assessed, they added.

DRDO's list of 108 military systems

At the same time, DRDO has identified 108 military systems and subsystems like navigation radars, tank transporters and missile canisters for India's domestic industry to design, develop and manufacture.

The list of the items was handed over to the Defence Minister by a high-level delegation from the DRDO. The MoD said the DRDO will also provide support to industries for design, development and testing of these systems on a requirement basis. The initiative is in sync with the government's focus on achieving self-reliance in the defence sector, it added.

The DRDO has set a target of 2021 for developing the systems and subsystems. "All the requirements of these systems by R&D establishments, armed forces, and other security agencies can be met through development contracts or production orders on suitable Indian industry. This will allow DRDO to focus on the design and development of critical and advanced technologies and systems," said the MoD's statement.

The Defence Ministry has set a goal of a turnover of Rs 1.75 lakh crore in defence manufacturing in the next five years that includes an export target of Rs 35,000 crore worth of military hardware.

"Responding to the clarion call given by the Prime Minister for 'Atmanirbhar Bharat' (self-reliant India), the DRDO has taken several initiatives to strengthen the indigenous defence ecosystem," said the ministry.

The present industry base for DRDO comprises 1800 MSMEs along with defence public sector undertakings, ordnance factories and large-scale industries. "DRDO has already taken major initiatives through various policies to involve Indian industry as development-cum-production partners, offering its technology to industry at nominal cost and providing free access to its patents," said MoD.

"This initiative will support the fast-growing Indian defence industrial ecosystem and will help the industry to contribute towards 'Atmanirbhar Bharat' in a big way," it added.

The list of items identified by the DRDO for domestic production includes mini and micro UAVs, mountain footbridge, modular bridge, mines laying and marking equipment, armoured engineering reconnaissance vehicle and anti-terrorist vehicle (ATV). Other items that have also found a place on the list are tank transporter, missile canisters, missile storage container, marine rocket launcher, satellite navigation receivers, navigation radars and high nitrogen steel among others.

Innovation contest

In a related development, the DRDO launched a contest to promote innovators in the fields of defence and emerging technologies in India to mark the fifth death anniversary of former President A P J Abdul Kalam. According to a Defence Ministry statement, the winners of 'Dare to Dream 2.0' contest would be decided after due evaluation by an expert committee. "Award money, up to Rs 10 lakh for start-up and Rs 5 lakh in individual category, will be given to the winners," it added.

MoD said the contest is being launched by DRDO to 'promote the individuals and start-ups for innovation in defence and aerospace technologies in the country after the call of 'Atmanirbhar Bharat' given by Prime Minister Narendra Modi.'

A noted scientist, Kalam is known as the 'missile man' as he was part of many successful projects for development of ballistic missiles and satellite launch vehicle technology during his lifetime. Rajnath Singh also expressed his happiness to announce the contest for the 'Ignited Minds', whether innovators or start-ups.

HAL's Indigenous LUH Completes Hot & High Altitude Trials in Himalayas

HAL's indigenously developed Light Utility Helicopter (LUH) demonstrated high altitude capability in Hot and High weather conditions in the Himalayas recently for about 10 days. A comprehensive test plan was executed at Leh (3300 MAMSL) in temperatures up to ISA+320C which included envelope expansion, performance and flying qualities. LUH took off from Leh and demonstrated its hot and high hover performance at Daulat Beg Oldie (DBO) Advanced Landing Ground (ALG) at 5000 MAMSL. The helicopter also demonstrated its payload capability in Siachen glacier high altitude. During the trials, pilots landed the helicopter at the highest helipads of Amar and Sonam.

HAL has once again proved its indigenous capability in design & development. The Army version of LUH is now ready for Initial Operational Clearance, says R. Madhavan, CMD, HAL. According to Arup Chatterjee, Director (Engineering and R&D), HAL, the performance of the helicopter and its systems are satisfactory fulfilling the requirements of the users. All planned tests were successfully demonstrated.

The flights were carried out by composite trial team which included pilots from HAL, Wg Cdr (Retd) Unni Pillai, CTP (RW), Wg Cdr (Retd) Anil Bhambani, Gp Capt (Retd) Pupinder Singh and Gp Capt V Panwar along with Gp Capt R Dubey, Sq Ldr Joshi (from Indian Air Force) and Lt Col R Grewal & Lt Col Pawan (from Indian Army). Representatives from certification authorities also witnessed the trials.

The Initial Operational Clearance for basic LUH was accorded by CEMILAC for IAF variant on February 7, 2020 during DefExpo 2020 at Lucknow in the presence of Defence Minister and the Chief Minister of Uttar Pradesh. ■

AEPL: Playing a Key Role in 'Make in India'

R. Sundaram
CEO
Aerospace Engineers

AEROSPACE ENGINEERS PRIVATE LIMITED

The Government of India is providing a host of opportunities to micro, small and medium enterprises (MSMEs) and start-ups as well as supporting them under the 'Make in India' programme. Such measures have gone a long way in giving a boost to the Indian economy. Aerospace Engineers Pvt. Ltd. (AEPL), an MSME engaged in the production of high-precision non-metallic and metallic parts and assembly manufacturing under one roof, has also benefited from the government's initiatives and has received several contracts, mostly from public sector undertakings and Defence industries.

Based at Salem in Tamil Nadu, AEPL is a manufacturer of high-precision non-metallic and metallic parts and assemblies used mainly in Aerospace and Defence. The company has received AS9100D certification for QMS, CEMILAC & RCMA for design, NADCAP for chemical processing, type approval for 120 varieties of rubber compound and CE Marking certificate for healthcare equipment spares. It is equipped with a FOD-free Rubber Manufacturing Shop and composite manufacturing, Hose Assemblies under DGCA certification, NABL accreditation for non-metallic test facilities and hose testing. All these unique facilities are available under one roof. AEPL is also certified with EMS – ISO 14001 and ISO45001.

All the processes at AEPL are environment-friendly. For instance, the company utilizes a 240 KW solar panel, carries out rain harvesting and conducts a follow-up of Environment Management Systems, among other measures. AEPL is also working towards certifications of ISO 13485, NADCAP for Elastomers and NABL.

One of core strengths of AEPL is its development speed. So far, the company has developed more than 15,000 parts through indigenisation, out of which 12,000 are non-metallic. Recently, AEPL developed around 75 parts and supplied about 30,000 sets for ventilators and compressors within a span of 45 days to join the

Aerospace Engineers Pvt. Ltd. (AEPL) is a manufacturer of high-precision non-metallic and metallic parts and assemblies used mainly in Aerospace and Defence. So far, the company has developed more than 15,000 parts through indigenisation, out of which 12,000 are non-metallic. AEPL is also supporting India's prestigious Tejas aircraft project by machining more than 300 structural parts.

war against the COVID-19 pandemic.

AEPL has introduced high-end machines for metallic and non-metallic part manufacturing, high precision CNC machines (Turning centre, milling centre (3,4,5 axis), turn mill and mill turn centres, hydraulic presses for rubber and composite moulding (30 to 500 tonne). The company is supporting India's prestigious Tejas aircraft project by machining more than 300 structural parts.

AEPL has a strong team of over 300 dedicated personnel engaged in manufacturing, assembly and testing. The firm has partnered with prestigious customers such as HAL, BDL, BrahMos, ISRO, DRDO and BEL in India as well as foreign companies like Boeing, Airbus (tier II), Strata, Eaton, Collins Aerospace and Continental Aerospace Technologies US, among others. AEPL has also signed a long-term contract with Egyptian Armament Authority for a period of five years for the supply of aerospace components.

As part of the initiatives for new product development, AEPL is engaged in major indigenisation projects like rotary shaft seals for helicopter gear box, solenoid in fuel system of aero engine, rubber fuel tank for UAV and helicopters.

Meanwhile, the Hosur plant of AEPL is all set to take up integration of aviation-related assemblies and sub-assemblies. It would also soon have an exclusive Research and Development Centre with state-of-the-art equipment meeting international standards and also world-class testing facilities.

AEPL has so far received 14 national awards, out of which two were presented by Prime Minister Narendra Modi. In addition, the company has won numerous state awards, district awards and other prestigious honours from SIATI, IEI and other organisations. According to AEPL, such recognition came to the company thanks to the excellent teamwork of its workforce.

U.S. Marine Corps Selects ICATS Solution of Elbit Systems

The United States Marine Corps selected Kollsman, Inc.'s solution for a multispectral, clip-on weapon night sight, allowing Marines to engage in day and nighttime operations at extreme stand-off distances. The selection is part of Phase II of the Integrated Clip-on Advanced Targeting Sight (ICATS) program and will require the company to design, build and test two sophisticated ICATS prototypes for the USMC over the next year. Kollsman, Inc. is a subsidiary of Elbit Systems of America.

Elbit Systems of America's ICATS solution is optimized for USMC scout snipers and reconnaissance Marines, so they may acquire targets and engage at extended ranges. The solution clips onto the Marine's weapon and provides critical information to the user, even in low-light or inclement weather. The ICATS is configured to provide simultaneous imaging across extended ranges, without adding considerable weight to the Marine's weapon.

"This selection by the U.S. Marine Corps shows the strong partnership we have with the Marines, as well as our expertise creating technology that benefits warfighters in the field," said Ridge Sower, vice president of Ground Combat and Precision Targeting at Elbit Systems of America. "With our ICATS solutio successfully co – no matter th remaining as safe as possible."

The ICATS solution builds off the company's successes offering the U.S. military other precision targeting capabilities, such as the Next Generation Hand-Held Targeting System for the USMC and the Multi-Domain User Sensor Architecture (MDUSA) targeting system for the U.S. Army. Work on ICATS will be designed and produced in Elbit Systems of America's Merrimack, New Hampshire facility, which is known for its sophisticated electro-optics solutions.

DRDO Successfully Flight Tests Hypersonic Technology Demonstrator Vehicle

G. Satheesh Reddy
Chairman
DRDO

Defence Research and Development Organisation (DRDO) has successfully demonstrated the hypersonic air-breathing scramjet technology with the flight test of Hypersonic Technology Demonstration Vehicle (HSTDV) from Dr APJ Abdul Kalam Launch Complex at Wheeler Island, off the coast of Odisha.

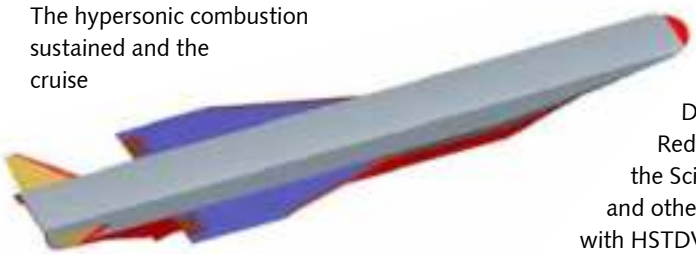
The hypersonic cruise vehicle was launched using a proven solid rocket motor, which took it to an altitude of 30 kilometres (km), where the aerodynamic heat shields were separated at hypersonic Mach number. The cruise vehicle separated from the launch vehicle and the air intake opened as planned. The hypersonic combustion sustained and the cruise vehicle continued on its desired flight path at a velocity of six times the speed of sound i.e., nearly 02 km/second for more than 20 seconds. The critical events like fuel injection and auto ignition of scramjet demonstrated technological maturity. The scramjet engine performed in a text book manner.

The parameters of launch and cruise vehicle, including scramjet engine was monitored by multiple tracking radars, electro-optical systems and Telemetry Stations. The scramjet engine worked at high dynamic pressure and at very high temperature. A Ship was also deployed in the Bay of Bengal to monitor the performance during the cruise phase of hypersonic vehicle. All the performance parameters have indicated a resounding success of the mission.

With this successful demonstration, many critical technologies such as aerodynamic configuration for hypersonic manoeuvers, use of scramjet propulsion for ignition and sustained combustion at hypersonic flow, thermo-structural characterisation of high temperature materials, separation mechanism at hypersonic velocities etc. were proven.

Defence Minister Rajnath Singh congratulated DRDO on this landmark achievement towards realising Prime Minister Narendra Modi's vision of Atmanirbhar Bharat. He also spoke to the scientists associated with the project and congratulated them on this great achievement. India is proud of them, he added.

Secretary Department of Defence R&D and Chairman DRDO Dr G Satheesh Reddy congratulated all the Scientists, Researchers and other personnel related with HSTDV mission for their resolute and unwavering efforts towards strengthening Nation's defence capabilities. On this successful demonstration, the country enters into the hypersonic regime paving way for advanced hypersonic Vehicles. ■



HSTDV Cruise Vehicle

Rosoboronexport increases Exports of Military Helicopters

JSC Rosoboronexport (part of the Rostec State Corporation) exhibited the full export lineup of Russian military helicopters at the International Helicopter Industry Exhibition HeliRussia-2020, at the Crocus Expo International Exhibition Center in Moscow.

"The Rosoboronexport delegation discussed with foreign partners the prospects for cooperation on supplying advanced helicopters of the world famous Mi and Ka brands abroad. Despite the current global difficulties, we assess the rate of contracting and replenishing the order book for Russian rotary-wing aircraft projected for the coming years as good. The world market isn't saturated yet; quite the opposite, this niche is expanding, mainly due to the versatility of helicopters, which can be used by law enforcement and civil structures everywhere, primarily in emergencies," said Alexander Mikheev, Director General of Rosoboronexport.

In the helicopter segment, Rosoboronexport's partners are represented by more than 70 countries in the Middle East, Asia-Pacific region, Latin America, Africa, CIS and Europe, where Russian rotorcraft are in service with army, counter-terrorism and special forces units, law enforcement agencies and emergency services. These reliable and durable machines have been successfully tested in combat and challenging climatic conditions, setting dozens of world records in various categories. They can do anything, from reconnaissance and strike missions, amphibious and rescue operations to the provision of emergency medical care to the population in areas remote from the basing points.

Mi-8/17 series military transport helicopters, the world market's bestsellers, have been most in demand and therefore most widespread in the world in their class for many years. Attack helicopters such as the Mi-35, Ka-52 and Mi-28, modernized with

regard to experience of their actual use in "hotbeds" of the planet, are gradually filling their niche. Foreign partners traditionally show great interest also in the Mi-26T2 heavy-lift helicopter, which is the absolute champion in its class.

Today, all Russian helicopters are manufactured at the enterprises of the Russian Helicopters holding (part of the State Corporation Rostec), which have extensive production, scientific and technological capacity. The training of foreign specialists is organized both in Russia and abroad.

Recent cases of Russia's helicopter export development include:

- signing of the first export contract for the supply of Mi-38T multi-mission helicopters;
- establishment of a joint Russian-Indian enterprise to manufacture the Ka-226T helicopters;
- commissioning of a helicopter flight training center in Venezuela built with the participation of specialists from the two countries.

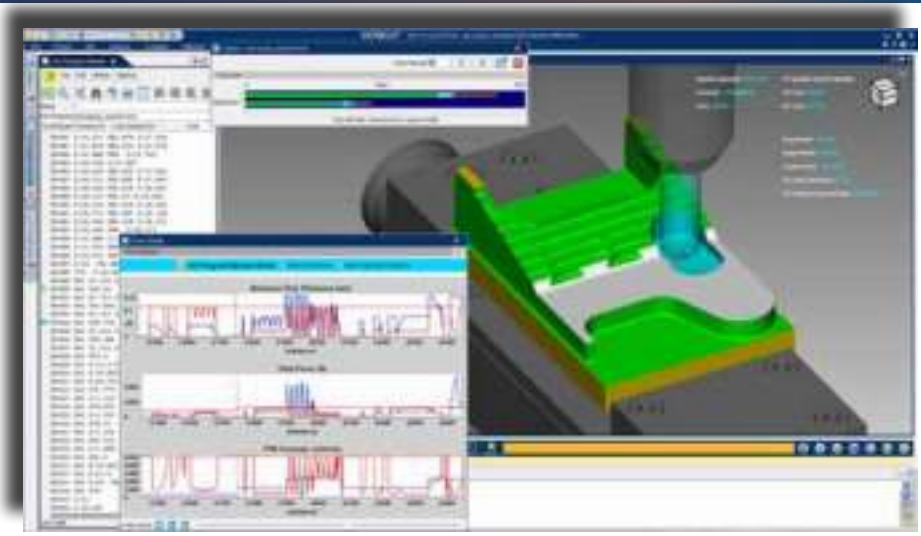
Particular attention is to be paid to the successful experience with the Mi-171E helicopters in a special "northern" version in Argentina, where the Russian machines operate effectively in the harshest Antarctic conditions. By the way, this contract "turned" 10 years old in 2020, a kind of anniversary.

"Over 1,000 Russian helicopters of different versions have been delivered abroad under Rosoboronexport contracts for almost 20 years. Rosoboronexport and Russian industrial enterprises are implementing helicopter repair, modernization and after-sales service projects, including on the premises of the established helicopter service centers. Together with Russian Helicopters, we work systematically in the areas of combating counterfeiting and protecting intellectual property rights in the process of military-technical cooperation related to an increasing amount of work within research activities,

licensed production, joint ventures establishment and other projects, which involve the transfer of Russian military and dual-use technologies," stressed Alexander Mikheev.

For 12 years, HeliRussia-2020 has justly earned a high status as the landmark event for the global helicopter industry where market professionals exchange experience, discuss current projects and plans for the future, and unveil cutting-edge developments. Leading industry experts from all over the world, interested in the latest products, innovative technologies and other production achievements of the Russian and global helicopter industry, gather here every year. That is why Rosoboronexport's business program at HeliRussia-2020 includes not only negotiations with partners, but also the participation of its specialists in round tables and conferences, seminars and presentations. ■

Optimization Module Tackles Tough Materials



In VERICUT Force, blue line "spikes" reveal excessive or unsafe cuts in the original program, while red lines show gains and corrections made by optimizing. (All images provided by CGTech.)

Most anyone who's worked in a machine shop for any length of time has at some point attended a trade show or machine tool distributor's open house. There they see canned demonstrations of CNC machines busily carving up chunks of brass, mild steel, or aluminum into business card holders and tic-tac-toe games. While these giveaways are fun stuff, wouldn't it be refreshing to see some real parts being machined, preferably from a difficult-to-machine material?

That's what took place at the Okuma Winter Showcase, an annual event the machine builder hosts for 600+ attendees. At the event, attendees were treated to more than two-dozen CNC machine tools under power, most of them making chips. These included an MU-8000V LASER EX super multitasker with laser metal deposition and the GENOS M460V-5AX, a trunnion-style, five-axis vertical machining center offering high productivity, a small footprint, and a surprisingly low-price tag.

There was also an LB3000 EX-II lathe with barfeed vibration detection, a MULTUS B300II turn-mill center with collaborative robot part handling, MA-500HII horizontal and MCR-A5CII double-column machining centers, and a MULTUS U3000 multitasking machine.

An impressive lineup, to be sure, but there was one demo that had a large number of show attendees talking, even those responsible for setting it up. "It was pretty cool to see, especially when you consider that we were cutting titanium, a very hard and difficult-to-machine material," says Okuma Applications Engineer Lee Johnston.

He's talking about CGTech's Force, a physics-based NC program optimization module that works within the company's flagship VERICUT toolpath simulation software. Working with representatives from CGTech and Sandvik Coromant, Johnston programmed a Ti-6Al-4V titanium bracket being made for an aerospace customer, then optimized its toolpaths with VERICUT Force.

"We had the same demo on two vises and ran them side-by-side, one with the standard program and one that was optimized," said Johnston. "We reduced cycle time from an hour to just under 40 minutes, and you could also hear and see the difference in how the tools were cutting and tell that the optimized program was easier on the machine. This is probably the best thing to happen to programming since trochoidal toolpaths."

VERICUT Product Specialist Pete Haas explained that Force works by analyzing the NC toolpath, evaluating the changing cutting conditions, and increasing or decreasing the feed rate to achieve the ideal chip thickness for any given material. Compared to CAM systems and online machining calculators, which attempt to determine average chip thickness and base the feed rate on that, Force calculates the optimal feed rate for every single line of machining code.

"As an example, think about driving to work each morning," Haas said. "You encounter straight sections, curves, and sharp turns, and have to slow down or speed up depending on the road conditions. Machining also involves constantly changing conditions, but some CAM systems don't account for this. They generate a single feed rate that may be too aggressive on tight turns and too slow on the straightaways. Force, on the other hand, uses physics to calculate cut-by-cut throughout the changing conditions and determine the optimal feed rates."

The result, according to Haas, is greatly reduced cycle time, improved tool life, better part quality, and less wear and tear on CNC machine tools. It works on any material and any machine, and can even be used on legacy programs.

Johnston wasn't the only one surprised by Force's capabilities. Even CGTech Technical Support Engineer Chris Davala—someone with 20 years of experience as a machinist and programmer who now works with VERICUT customers across the country—said the demo was an eye opener. "To be honest, I was a little skeptical," he said. "This was my first hands-on experience with the product, and it's not that I didn't have faith in the people who developed it, but there were some bold claims made about the potential gains. I can truly say that, after seeing Force in action, it's made a believer out of me."

That's an easy thing to say for someone

employed by the product's developer. But Sandvik Coromant MTS specialist Richard Howard, who worked alongside Davala and Johnston setting up the demo, backs it up. He supplied the cutting tools and toolholders used for the demo and specified the initial machining parameters.

"As a tooling specialist, I am extremely impressed with how 'spot on' the Force software is," he said. "CGTech has done an amazing job of optimizing programs while taking into consideration tooling geometries and resulting loads. Anyone interested in higher efficiency and prolonging tool life should look into this."

Anyone familiar with Okuma machine technology might consider Force unnecessary. That's because the OSP control offers advanced features such as Machining Navi, SERVONAVI, Super-NURBS, and adaptive machining technology. How can a third-party software package make a top-notch machine tool perform even better? There are several answers:

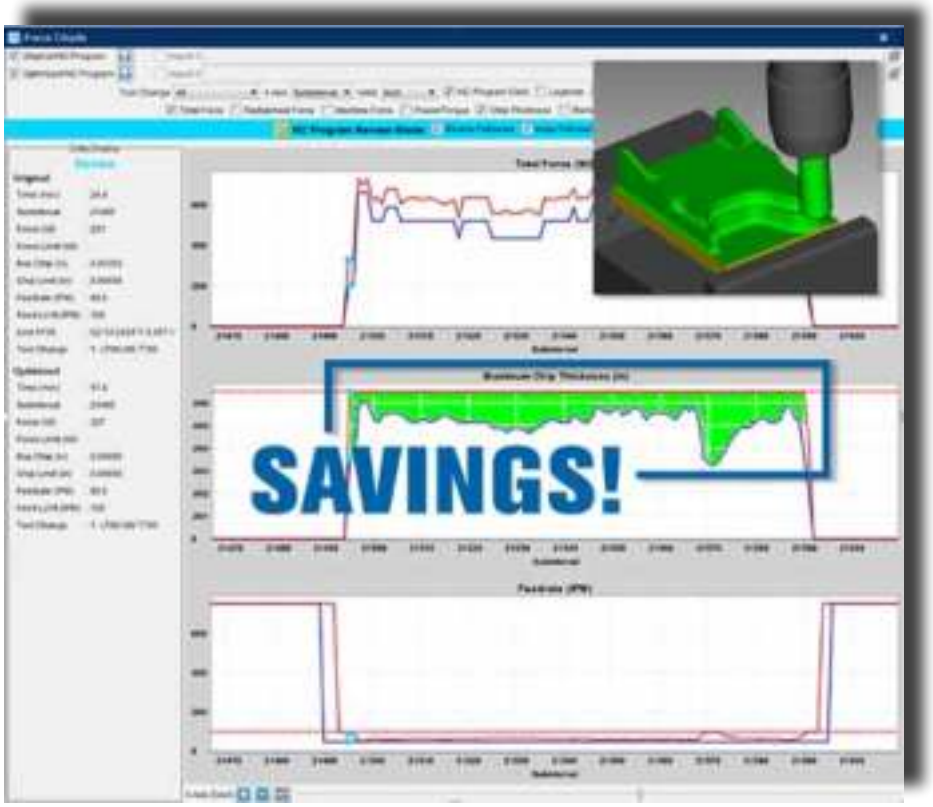
Force has the ability to break up the NC code into smaller bites, adjusting feed rates to maximize chip thickness and keep it constant.

Its optimization capabilities are proactive, not reactive, so everyone knows what to expect before pushing the cycle start button.

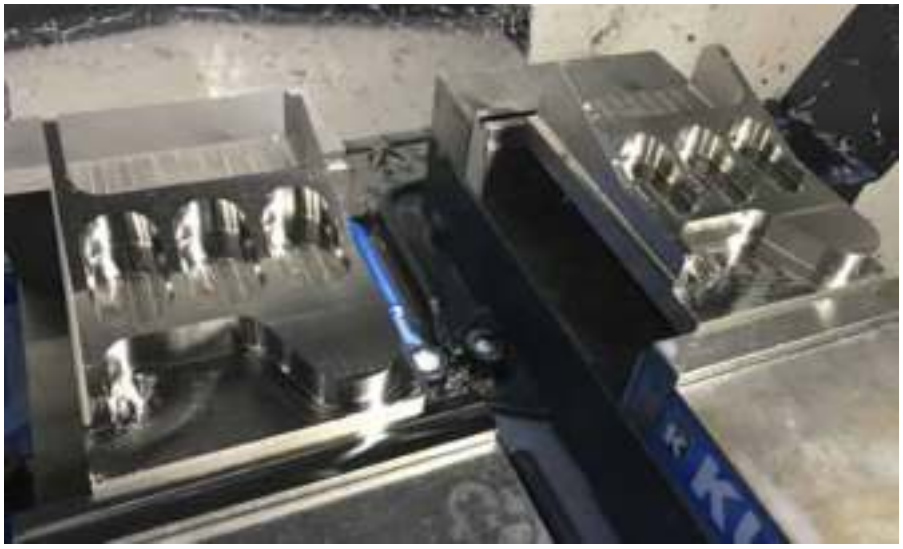
Performance issues are clearly identified up front, and the programmer can examine the Force Charts that illustrate projected cutting forces, chip thickness, feed rates, tool deflection and more.

For new materials, new machine tools and cutters, or even new programmers, Force eliminates the guesswork that would otherwise occur.

The result is an NC program that's both safer and more predictable, with low risk of tool breakage or scrapped parts. Operators have more confidence. Lights-out machining is performed with confidence. Profit margins are improved. And Force-optimized toolpaths "save a great deal of time during roughing," says Sandvik's Howard. Parts are machined faster and cutting tools last longer.



In the Okuma demonstration, the VERICUT Force Optimized finished part on the left was produced more than 20% faster than the original programmed part on the right.



Haas summed it up like this: "Force charts provides NC programmers with useful information they never had before. They can quickly and easily visualize what's happening cut-by-cut as the tool moves through the material, and it's now possible to visualize excessive forces, inefficient cutting parameters, metal removal rate, power consumption, torque, and tool deflection. Force charts also expose cutting condition improvement opportunities. With one click on the Force chart, the user is taken to the exact location in the program and to the graphical review window for further analysis. The end result is full utilization of the cutting tool and the machine tool."

Okuma's Lee Johnston agreed. "At the event we were cutting titanium and saw significant improvement, but I think Force is just as suitable for machining easier materials like aluminum, and for other general purpose work. I look forward to using it on future projects."

Defence Ministry announces Embargo for the Import of 101 Items

Prime Minister Narendra Modi in his address to the Nation on May 12, 2020 had given a clarion call for a self-reliant India based on the five pillars, i.e., Economy, Infrastructure, System, Demography & Demand and announced a special economic package for Self-Reliant India named 'Atmanirbhar Bharat'.

Taking cue from that evocation, the Department of Military Affairs (DMA), Ministry of Defence (MoD) has prepared a list of 101 items for which there would be an embargo on the import beyond the timeline indicated against them, as indicated in the attached Annexure.

This is a big step towards self-reliance in defence. It also offers a great opportunity to the Indian defence industry to rise to the occasion to manufacture the items in the negative list by using their own design and development capabilities or adopting the technologies designed and developed by Defence Research and Development Organisation (DRDO) to meet the requirements of the Armed Forces in the coming years.

The list is prepared by MoD after several rounds of consultations with all stakeholders, including Army, Air Force, Navy, DRDO, Defence Public Sector Undertakings (DPSUs), Ordnance Factory Board (OFB) and private industry to assess current and future capabilities of the Indian industry for manufacturing various ammunition/ weapons/platforms/ equipment within India.

Almost 260 schemes of such items were contracted by the Tri-Services at an approximate cost of Rs 3.5 lakh crore between April 2015 and August 2020. With latest embargo on import of 101 items, it is estimated that contracts worth almost Rs four lakh crore will be placed upon the domestic industry within the next five to seven years. Of these, items worth almost Rs 1,30,000 crore each are anticipated for the Army and the Air Force while items worth almost Rs 1,40,000 crore are anticipated by the Navy over the same period.

The list of 101 embargoed items comprises of not just simple parts but also some high technology weapon systems like artillery guns, assault rifles, corvettes, sonar systems, transport aircrafts, light combat helicopters (LCHs), radars and many other items to fulfil the needs of our Defence Services. The list also includes, wheeled armoured fighting vehicles (AFVs) with indicative import embargo date of December 2021, of which the Army is expected to contract almost 200 at an approximate cost of over Rs 5,000 crore.

Similarly, the Navy is likely to place demands for submarines with indicative import embargo date of December 2021, of which it expects to contract about six at an approximate cost of almost Rs 42,000 crore. For the Air Force, it is decided to enlist the light combat aircraft LCA MK 1A with an indicative embargo date of

ANNEXURE

IMPORT EMBARGO LIST OF DEFENCE WEAPONS/PLATFORMS

With Effect From Dec 2020

SNo	Name of Platform/ Weapon/ System/ Equipment	Indicative Year- Import Embargo
1.	120mm Fin Stabilised Armour Piercing Discarding Sabot (FSAPDS) Mark II Ammunition	Dec 2020
2.	7.62x51 Sniper Rifle	Dec 2020
3.	Tracked Self Propelled (SP) Gun (155mm x 52 Cal)	Dec 2020
4.	Towed Artillery Gun (155mm x 52 Cal)	Dec 2020
5.	Short Range Surface to Air Missiles (Land variant)	Dec 2020
6.	Shiplborne Cruise Missiles	Dec 2020
7.	Multi Barrel Rocket Launcher (MBRL) (Pinaka Variant)	Dec 2020
8.	Simulators Presenting Smart Ranges And Multi-Function Targets	Dec 2020
9.	Battalion Support Weapons Simulators	Dec 2020
10.	Container-based Simulators for Live Fire Training	Dec 2020
11.	Tailor-made Simulators for Counter Insurgency (CI)/Counter Terrorism (CT) based Training	Dec 2020
12.	Force-on-force Live Tactical Simulators / Infantry Weapon	Dec 2020
13.	Tank Simulators (driving, as well as, crew gunnery)	Dec 2020
14.	155mm/39 Cal Ultra-Light Howitzer	Dec 2020
15.	Successor of Flycatcher & Upgraded Super Rederstraus (USFM) / Air Defence Fire Control Radar (ADFCR)	Dec 2020
16.	Component Level Repair Facility for Tank T-90	Dec 2020
17.	Shiplborne Close in Weapon System	Dec 2020
18.	Bullet Proof Jackets	Dec 2020
19.	Ballistic Helmets	Dec 2020
20.	Missile Destroyers	Dec 2020
21.	Multi-Purpose Vessel	Dec 2020
22.	Offshore Patrol Vessel	Dec 2020
23.	Next Generation Missile Vessels	Dec 2020
24.	Anti-Submarine Warfare Shallow Water Crafts	Dec 2020

SNo	Name of Platform/ Weapon System/ Equipment	Indicative Year- Import Embargo
25.	Water Jet Fast Attack Craft	Dec 2020
26.	Ammunition Barges	Dec 2020
27.	55ton Bollard - Pull Tugs	Dec 2020
28.	Survey Vessels	Dec 2020
29.	Floating Dock	Dec 2020
30.	Diving Support Vessels	Dec 2020
31.	Pollution Control Vessels	Dec 2020
32.	Anti-Submarine Rocket Launchers	Dec 2020
33.	Shiplborne Medium Range Gun	Dec 2020
34.	Torpedo Tube Launcher for Light Weight Torpedoes	Dec 2020
35.	Magneto - Rheological Anti Vibration Mounts	Dec 2020
36.	All variants of Depth Charges	Dec 2020
37.	Shiplborne Sonar System for Large Ships	Dec 2020
38.	Hull Mounted Submarine Sonar	Dec 2020
39.	Short Range Maritime Reconnaissance Aircraft	Dec 2020
40.	Anti-Submarine Rocket	Dec 2020
41.	Chaff Rockets	Dec 2020
42.	Chaff Rocket Launcher	Dec 2020
43.	Integrated Ship's Bridge System	Dec 2020
44.	Light Combat Aircraft (LCA) MK I A - Enhanced Indigenised Content	Dec 2020
45.	Light Combat Helicopters	Dec 2020
46.	General Purpose Pre Fragmentation Bombs between 250-500 Kg	Dec 2020
47.	Radar Warning Receiver (RWR) for Transport Aircraft	Dec 2020
48.	Ground Based Mobile ELINT System	Dec 2020
49.	Transport Aircraft (Light)	Dec 2020
50.	GSAT-6 Satellite Terminals	Dec 2020
51.	Aerial Delivery Systems for Transport Aircraft	Dec 2020

SNo	Name of Platform/ Weapon/ System/ Equipment	Indicative Year- Import Embargo
52.	Digital Tropo Scatter/LOS Communication System	Dec 2020
53.	Low Level Transportable Radar	Dec 2020
54.	High Power Radar (HPR)	Dec 2020
55.	CBRN Detection & Monitoring System	Dec 2020
56.	CBRN Decontamination & Protection System	Dec 2020
57.	Parachute Tactical Assault (PTA)- G2	Dec 2020
58.	Dragunov Upgrade System	Dec 2020
59.	PKMG Upgrade System	Dec 2020
60.	Simulators for A Vehicles / B Vehicles	Dec 2020
61.	Simulators for Towed and Self Propelled Guns of Air Defence	Dec 2020
62.	Simulators for Correction of Fire by Observers	Dec 2020
63.	Military trucks of 4x4 and above variants: 12x12, 10x10, 8x8, 6x6	Dec 2020
64.	Fixed Wing Mini UAVs	Dec 2020
65.	500 Ton Self Propelled Water Barges	Dec 2020
66.	Software Defined Radio (TAC) for IN	Dec 2020
67.	Next Generation Maritime Mobile Coastal Battery (Long Range)	Dec 2020
68.	Advance Landing Ground Communication Terminals (ALGCTs)for AGLs	Dec 2020
69.	Field Artillery Tractor (FAT) 6X6 for Medium Guns	Dec 2020

With Effect From Dec 2021

SNo	Name of Platform/ Weapon/ System/ Equipment	Indicative Year- Import Embargo
70.	Wheeled Armoured Fighting Vehicle (AFV)	Dec 2021
71.	Light Machine Gun	Dec 2021
72.	125 mm Fin Stabilised Armour Piercing Discarding Sabot (FSAPDS) New Generation Ammunition	Dec 2021
73.	Assault Rifle 7.62 x 39mm	Dec 2021
74.	30 mm Ammunition for Infantry Fighting Systems	Dec 2021
75.	Mine Fragmentation	Dec 2021
76.	Mine Anti-tank	Dec 2021
77.	Mine Anti-Personnel Blast	Dec 2021
78.	Multipurpose Grenade	Dec 2021
79.	Inertial Navigation System for Ship Application	Dec 2021
80.	Conventional Submarines	Dec 2021

Dec 2022 Onwards

SNo	Name of Platform/ Weapon/ System/ Equipment	Indicative Year- Import Embargo
81.	40mm UBGL (Under Barrel Grenade Launcher)	Dec 2022
82.	Lightweight Rocket Launcher	Dec 2022
83.	155 mm Artillery Ammunition	Dec 2022
84.	EW Systems	Dec 2022
85.	Material Handling Crane 2.5 to 7.5 Tons (Vehicle Mounted)	Dec 2023
86.	GRAD BM Rocket	Dec 2023
87.	30MM HEI/HET	Dec 2023
88.	ASTRA-MK I Beyond Visual Range Air to Air Missile (BVR AAM)	Dec 2023
89.	EW Suit for MI-17 V5	Dec 2023
90.	Communication Satellite GSAT-7C	Dec 2023
91.	Satellite GSAT 7R	Dec 2023
92.	Basic Trainer Aircraft (BTA)	Dec 2023
93.	Expendable Aerial Targets	Dec 2024
94.	Small Jet Engines with 120kgf thrust	Dec 2024
95.	Light Low Level Terrain Radar (LLLWR)	Dec 2024
96.	Close in Weapon System (**Land based**)	Dec 2024
97.	23 mm ZU Ammunitions	Dec 2024
98.	30mm VOG 17	Dec 2024
99.	Electronic Fuses for Artillery Ammunitions	Dec 2024
100.	Bi- Modular Charge System (BMCS)	Dec 2024
101.	Long Range – Land Attack Cruise Missile	Dec 2025

Taj Junk Box

Taj Junk Box written by Air Marshal Prashant Khandekar AVSM is a collection of articles covering a wide range of topics from ICT and influence operations to aerospace warfare to aircraft maintenance to self reliance to foreign policy to human behaviour not to miss humour in jointmanship in defence forces with special reference to Indian Air Force.

Air Marshal Prashant Khandekar AVSM retired as AOM in 2016. A Fellow of AeSI, IETE and IIIE, he is recipient of Distinguished Alumni Award of NITIE, VNIT and Hadas High School. His book 'Under the Wings,On the Tarmac' has been well received. He is on Board of Directors of Pawan Hans Limited and is Adjunct Faculty of NIAS Bengaluru.

December 2020. Of these, 123 are anticipated at an approximate cost of over Rs 85,000 crore. Hence, there are highly complex platforms that are included in the list of 101 items, of which details of three examples are given above.

The embargo on imports is planned to be progressively implemented between 2020 to 2024. The aim behind promulgation of the list is to apprise the Indian defence industry about the anticipated requirements of the Armed Forces so that they are better prepared to realise the goal of indigenisation. The MoD has adopted many progressive measures to encourage and facilitate 'Ease of Doing Business' by the defence Production entities. All necessary steps would be taken to ensure that timelines for production of equipment as per the Negative Import List are met, which will include a co-ordinated mechanism for hand holding of the industry by the Defence Services.

More such equipment for import embargo would be identified progressively by the DMA in consultation with all stakeholders.

A due note of this will also be made in the Defence Acquisition Procedure (DAP) to ensure that no item in the negative list is processed for import in the future.

In another relevant step, the MoD has bifurcated the capital procurement budget for 2020-21 between domestic and foreign capital procurement routes. A separate budget head has been created with an outlay of nearly Rs 52,000 crore for domestic capital procurement in the current financial year.

German Eurofighters Connect with Remote Carriers

Interconnectivity between remote carriers and Eurofighter Typhoons of the German Airforce has been successfully proven for the first time during a live exercise.

The technology milestone was hit during the recent German Air Force Timber Express exercise over Northern Germany and the North Sea. It represents the first time the interconnectivity of the Airbus Defence and Space remote carrier technology in a multi-data link environment has been demonstrated with real fighter aircraft.

The communications, which also included Tornado fighters and NATO cooperative ESM Operations, were established within the framework of existing IT security regulations and NATO classification levels.

During the exercise, the remote carriers, which currently use the Compact Airborne Networking Data Link (CANDL), were successfully connected to Link16, the operational tactical data link of the armed forces.

The remote carriers were not only visible to all tactical combat aircraft of the Air Force, but could also receive and execute orders without the need for technical modifications to the aircraft. This marks a first in Europe and is also a further milestone towards a future combat air system (FCAS).

A further step was the demonstration of interoperability with the NATO concept of Co-operative ESM Operations (CESMO). This is a reconnaissance network spanning several branches of the armed forces aimed at locating threat systems in the electromagnetic spectrum in real time.

Airbus has succeeded in integrating the remote carriers as full component in the CESMO reconnaissance network. The simulated reconnaissance results of the remote carriers were made immediately available to the CESMO Fusion Element during the exercise and merged in real time with other reconnaissance results such as those of a flying Tornado ECR.

Vice Admiral SR Sarma has Assumed Charge as the Chief of Materiel, of Indian Navy

Vice Admiral SR Sarma, AVSM, VSM has assumed charge as the Chief of Materiel, of the Indian Navy on September 1st. The Admiral is a post graduate in Computer Science and Engineering from IISc, Bengaluru and a distinguished alumni of Naval Higher Command Course.

During his illustrious career spanning over three and a half decades, the Admiral has served onboard Indian Naval ships Vindhyagiri, Rana, Krishna and Mysore in various capacities.

He has tenanted varied and challenging appointments in Naval Dockyards at Mumbai and Visakhapatnam, and at Weapons and Electronics Systems Engineering Establishment (WESEE), Headquarters, Advanced Tactical Vessel Program (HQ ATVP) and Naval Headquarters in New Delhi.

As a Flag Officer, the Admiral has served as Assistant Chief of Materiel (IT & Systems) in Naval Headquarters, Admiral Superintendent of Naval Dockyard, Visakhapatnam; Chief Staff Officer (Technical), HQ ENC; Director General Naval Projects at Vishakhapatnam, Programme Director, HQ ATVP; and as Controller of Warship Production and Acquisition in Naval Headquarters.

In recognition of his distinguished services, the Admiral was awarded the Ati Vishisht Seva Medal and Vishisht Seva Medal. He is also a recipient of Lt VK Jain Gold Medal in 1994.

As a Principal Staff Officer and the senior most Technical Officer in the Indian Navy, the Admiral would be in charge of all aspects related to Maintenance Management and Life-Cycle Product Support of all Engineering, Electrical, Electronic, Weapons, Sensors, and IT related equipment and systems for ships and submarines; and creation of major marine and technical infrastructure.

He relieves Vice Admiral GS Pabby, PVSM, AVSM, VSM who superannuates on completion of an illustrious Naval career spanning close to four decades.

Rosoboronexport and Technodinamika Signs MOU to Promote Flight Simulators

JSC Rosoboronexport and JSC Technodinamika, which are part of the Rostec State Corporation, signed a joint action program to promote aircraft training aids in the external market. The agreement was signed during the Army 2020 International Military-Technical Forum.

The program which covers the period from 2020 to 2022 aims to organize effective interaction between Rosoboronexport and Technodinamika in order to increase exports of training equipment for military, dual-use and civil aircraft.

"The practice of the air forces around the world suggests that through crew training can often minimize, if not avoid, non-battle losses in personnel and materiel. Russian flight simulators have proven themselves effective. They are extensively used for training foreign specialists in Russia under Rosoboronexport's contracts, as well as supplied to our partners for training pilots abroad. Today, our portfolio of orders includes contracts for the supply of Technodinamika's flight simulators to more than 15 countries from various regions of the world. Together, I am sure, we will achieve a steady growth in this indicator," said Alexander Mikheev, Director General of Rosoboronexport and Deputy Chairman of the Russian Engineering Union.

Consolidation of classroom knowledge and skill training is carried out on advanced simulator systems, using the latest domestic advances in environment visualization and simulation of the dynamic characteristics of the aircraft being mastered, up to the operational use of weapon systems. At the customer's request, the simulator systems, being purchased together with the basic equipment, can be used at this stage.

The distinctive features of the flight simulators supplied by Rosoboronexport are the exclusive use of the aircraft manufacturer's official data during their development, as well as the scalability of simulator systems and an opportunity to quickly integrate them into distributed training systems and simulate situations of any complexity.

Elbit Awarded Contract for Assemblies for the F-35

Elbit Systems Ltd. announced that its wholly-owned subsidiary, Elbit Systems - Cyclone Ltd., was awarded a contract by Lockheed Martin for the manufacture of assemblies for Forward Equipment Bay assemblies for the F-35. The contract is in an amount that is not material to Elbit Systems and will be performed over a period of four-years.

The contract calls for Elbit Systems to supply assemblies for the F-35's Forward Equipment Bay – made from composite materials and the associated structures – for all F-35 aircraft variants. Elbit Systems will deliver more than 1,400 components to Lockheed Martin during the contract period. The decision by Lockheed Martin comes as a result of Elbit Systems successful performance on the production of other composite structures for the F-35 program.

This award further expands Elbit Systems work on the F-35, which includes the helmet mounted display systems, the development of the panoramic cockpit display, power amplifiers and 22 different structural assemblies.

Yoram Shmuely, General Manager of Elbit Systems Aerospace Division, said: "We are proud to have been selected by Lockheed Martin to provide additional structural assemblies for the F-35 aircraft. This contract reflects the recognition and trust we have established with Lockheed Martin in our many years of collaborative work".

Defence Minister Inaugurates HAL-IISc Skill Development Centre in Karnataka

Defence Minister Rajnath Singh inaugurated the HAL-IISc Skill Development Centre (SDC) established at IISc's Challakere campus in Chitradurga district (Karnataka), 225 km from Bengaluru through video conference. Speaking on the occasion, the Defence Minister said knowledge is power and skilled workforce is necessity for innovation and creativity. The SDC is a sound example of synergistic collaboration between the country's flagship aerospace giant and the best in class premier academia, he added.

General Bipin Rawat, Chief of Defence Staff, Dr. Ajay Kumar, Defence Secretary, Raj Kumar, Secretary (Defence Production), R Madhavan, CMD, HAL, Alok Verma, Director (HR), HAL, Prof. G Rangarajan, Director, IISc also participated in the event.

The centre will impart skills to various beneficiaries ranging from local community members to high-end engineering professionals to usher true 'Make-in-India', says Madhavan.

"We are grateful to HAL for supporting us and partnering with us on this critical national initiative," says Prof. Rangarajan. "We eagerly look forward to working closely with HAL, to realize our shared vision of training hundreds of aspiring young workers and professionals from across the country".

The goal of the SDC is to create a large pool of trained personnel to address vital skill development gaps in India, crucial for economic growth and self-sufficiency. It is a natural outgrowth of a successful training programme for rural science and mathematics teachers that IISc initiated in 2011 at the Challakere campus. The IISc approached HAL in 2016 with its proposal and HAL agreed to fund and support the initiative under its Corporate Social Responsibility (CSR) programme. The MoU for establishing the centre, with an outlay of Rs. 73.7 crores was signed on March 28, 2016 and construction began on October 27 the same year. The SDC is located in 1,500 acres of land provided by the Government of Karnataka during IISc's centenary year celebrations in 2008.

Schiebel, Nordic Unmanned Demonstrated Cargo Delivery Capability of CAMCOPTER® S-100

Schiebel, together with partner Nordic Unmanned, successfully demonstrated the cargo delivery capability of its Unmanned Aerial Vehicle (UAV) CAMCOPTER® S-100 to offshore platform Troll A to Norwegian energy company Equinor.

This is world's first in terms of full-scale offshore UAV delivery from shore to an active oil and gas installation. The exercise simulated the scenario of an urgent requirement for specific essential spare parts at the gas production platform Troll A. The CAMCOPTER® S-100 successfully carried out the long-range delivery flight from Mongstad, where the spare parts were 3D-printed, to the offshore platform Troll A located in the North Sea.

The unmanned delivery distance was 100 km (55 nm). After the UAV supplied the spare parts, it carried out a close inspection around the platform before it headed back to Mongstad. The flight trials also included a successful Search and Rescue (SAR) mission, where a "man over board" dummy was quickly located by the UAV, transmitting the positioning data and live images using the L3 Harris Wescam real-time Electro-Optical/Infra-Red (EO/IR) camera and an Automatic Identification System (AIS).

Hans Georg Schiebel, Chairman of the Schiebel Group, said: "This was the perfect trial to show off the exceptional maritime capabilities of the S-100 for the oil and gas industry. We have extensive experience in long-range unmanned flights, especially in the maritime domain and under adverse weather conditions. The S-100 was able to show off its outstanding capabilities and we have proven once again that the S-100 UAV is the superior choice."

SEED to Boost Startups, MSMEs in Space Sector

Space Enterprise Encouragement and Development (SEED) announced by the Government of India is envisaged as a competitive early-stage encouragement programme for innovative small business concerns or startups interested in products or services in focus areas of space technology, said the ISRO Chairman.

Dr. K Sivan
Chairman
ISRO

The Government of India has announced 'Space Enterprise Encouragement and Development' (SEED), a new programme for promoting startups and MSMEs in the space sector. Meanwhile, the Department of Space has said that it would be releasing a list of space technology products and services for the private sector to develop. The Indian Space Research Organisation (ISRO) had also recently announced three challenges under the Atal Innovation Mission's ARISE programme and a team of experts is reviewing more than 200 notable proposals.

India's space sector has been opened up to private players and ISRO is now engaged in strengthening its efforts to promote startups and MSMEs to create space technology for the future. ISRO Chairman and Department of Space (DoS) Secretary K Sivan had earlier announced the three new challenges — propulsion, geospatial information, and robotics/AR/VR — under the Atal Innovation Mission ARISE programme. "Over 200 proposals are already under review with experts. Similar announcements of opportunities will be made for our future programmes, including planetary missions," said Sivan.

He also said that the private sector was a 'co-traveller' in India's space endeavours. Addressing an ISRO workshop, the space agency's Chairman gave hints that more such challenges would be announced in future.

SEED is one among these programmes. "SEED is envisaged as a competitive early-stage encouragement programme for innovative small business concerns or startups interested in products or services in focus areas of space technology," said Sivan.

At the same time, the Department of Space is engaged in compiling a list of potential products and services in space technology and application that can be developed by the industry. "The Department will also support the private industry to expand their existing network of incubation programmes," said Sivan.

The ISRO Chairman said that the mechanism for technical mentorship from the Department of Space has also been initiated.

HAL Helicopters in Rescue Operations at Mauritius Reef

HAL's indigenous Advanced Light Helicopter Dhruv and Chetak helicopters were pressed into service to rescue people and extricate skimmed oil from the Japanese owned cargo ship MV Wakashio. The ship was on its way from China to Brazil but ran aground on the reef at Pointe d'Esny, Mauritius recently.

"Time and again the indigenous Dhruv helicopter have proven its capabilities. Our helicopters were extensively utilized for search and rescue operations in the past as well", says R Madhavan, CMD, HAL.

Thanks to the Indian Air Force, Indian Coast Guards and Mauritius police, HAL helicopters flew non-stop dawn to dusk till all the survivors on board were safely rescued. A total of 210 cargo operations and 270 winch operations were undertaken by HAL choppers towards salvage and rescue missions so far. The Chetak helicopters were used primarily for winching survivors. The ALHs flew continuous missions to get the international salvage team on-board the ship to contain the spill.

The spill was close to two environmentally protected marine ecosystems and the Blue Bay Marine Park reserve. Nearby are a number of popular tourist beaches and mangrove plantations. Mauritius had declared a state of environmental emergency. A crack inside the hull of the ship expanded earlier this week leading to the ship splitting into two halves.

Dhruv is indigenously designed and developed by HAL for the military as well as civil applications. The utility version of the Dhruv helicopter can be used for VIP travel, commuter, search and rescue, emergency medical service, under slung load, disaster relief, and offshore operations. Dhruv helicopter is suitable for increased payload at higher altitudes and is in operation with all the three Service wings. More than 240 helicopters are operational with the Indian Armed Forces clocking more than 2,70,000 flying hours.

Defence Minister Inaugurates BEML's Industrial Design Centre

BEML's Industrial Design Centre (IDC), located at its Bangalore Complex was inaugurated by Defence Minister Rajnath Singh.

The inauguration was done virtually in the presence of Minister of State for Defence Shripad Naik, Secretary Defence Dr. Ajay Kumar, Secretary Defence (Production) Rajkumar.

Inaugurating the Centre, Rajnath Singh said, "We are celebrating the 'Atmanirbhar' week to focus on modernisation of defence infrastructure, creation of new manufacturing capability and investments in the sector. BEML's Industrial Design Centre will propel innovative thinking for the future in this regard."

The Design centre will focus at implementing Industrial Design & Human Factors in all BEML Products as a part of developmental strategies for setting the global benchmarking of Industrial Design and Ergonomics. It will be integrated with R&D and manufacturing and will be a hub for exchange of creative ideas and concepts and will provide the 'Design-edge' for better Market & User acceptance.

The Designers, qualified from leading national level Institutes such as NID and IIT, at IDC have carried out a global benchmarking study by means of various research. These will mainly focus on enhancing the look and feel of BEML Products, Operators' ease of work and comfort as per global standards. It will harness the latest technologies like AI and Gesture Recognition and engineering resources for self-reliance, while being sensitive towards 'Eco', 'Green' & 'Sustainability'.

The manufacturing implementations of these strategies will be made possible with the in-house capabilities available with BEML, as well as through the company's network of MSMEs.

Dr. D. K.Hota, CMD, BEML said, "BEML is a highly diversified company and we have invested in developing in-house capabilities of Industrial Design & Human Factors, Engineering & IPs. This will address the 'design' facet of products - presently dependent on foreign facilities and move us towards self-reliant on product design in pursuit of 'AtmaNirbhar Bharat'."

First Delivery of Liebherr-Aerospace Stand-Alone Electronics Systems

The Liebherr Team has reached a major milestone with the delivery of the first engineering prototypes of the Nose Wheel Steering Remote Electronics Unit for the Boeing 787 Dreamliner and Main Gear Steering Control Unit for the Boeing Model 777 family of airplanes.

Liebherr started the program for the Boeing 787 Nose Wheel Steering Remote Electronics Unit (NWS REU) and for the Boeing 777 Main Gear Steering Control Unit (MGSCU) in the second half of 2018, followed by the in-time design and the implementation phase. The company provided the first engineering prototype units for testing at Boeing in February 2020, after intense testing at the Liebherr facilities.

This marked the first time for Liebherr to supply stand-alone electronics* and the company is very happy and proud to share this historic milestone with its customer Boeing.

Boeing engineers successfully carried out development tests and continue to perform testing to confirm the correct operation of the components. The Boeing and Liebherr Teams are working closely together on the final reviews and preparation for qualification testing.

The high level of functionality and maturity of the Liebherr products is already evident from the engineering tests completed, which will support a successful qualification phase in advance of Liebherr's serial release and Boeing's subsequent entry into service on the 777 family and 787.

The teams were satisfied with the progress to date, underscored by a successful Critical Design Review between Boeing and Liebherr; a great basis for further Liebherr stand-alone electronics system projects.

Rosoboronexport Renders Aid to Venezuela to Fight COVID-19

JSC Rosoboronexport (part of the Rostec State Corporation) has donated medical supplies to the Bolivarian Republic of Venezuela to fight the new COVID-19 coronavirus infection as part of its humanitarian activities.

The humanitarian cargo, including Russian-made test systems for the timely identification of infected persons and providing them with medical assistance, was delivered to Caracas and handed over to the Venezuelan side on August 18, 2020.

The new coronavirus pandemic poses an objective threat to the life and health of the population of many countries around the world. In this situation, Russia, which has accumulated a

lot of experience in countering large-scale epidemics, provides substantial assistance in this area to other states. Bearing in mind the bilateral strategic partnership, Rosoboronexport decided to provide humanitarian aid to Venezuela.

Rosoboronexport highly appreciates the level of military-technical cooperation between Russia and Venezuela, which fully corresponds to the nature of relations between our countries in recent years. As a result of successful and mutually beneficial cooperation, Venezuela has not only equipped its armed forces with advanced weaponry, but also considerably improved their training proficiency. This enables the country to reliably ensure its own defensive capacity and successfully counter drug trafficking and organized crime.

BIRD Foundation to Invest in Aeronautics & Prevision Joint Projects

The BIRD Foundation is to invest in an initiative to develop a Wide Area Motion Imagery (WAMI) sensor with an automated interface to an electro-optics payload on Aeronautics' Platforms.

Aeronautics Group - a leading provider of integrated turnkey solutions based on unmanned systems platforms, payloads and communications for defense, HLS and civil applications – has been awarded a special grant from the BIRD Foundation to promote a joint development project with American company, Prevision.

Projects submitted to the BIRD Foundation are reviewed by evaluators appointed by the National Institute of Standards and Technology (NIST) of the U.S. Department of Commerce, and the Israel Innovation Authority.

The joint project will see the two companies develop a real-time persistent surveillance system (WAMI) with an automated interface to an electro-optical camera. Designed specifically for use with unmanned aerial vehicles, the system will automatically detect any change that occurs in the field, and alert the operator to the exact location of the target, handing over the target to the EO/IR payload to meet the mission objectives.

Liebherr Air Management System Selected for Aerion AS2 Supersonic Business Jet

Liebherr-Aerospace has been selected by Aerion to develop and supply the integrated air management system for the new AS2 supersonic business jet. One of the system's key components will be an electrical air conditioning pack, which contributes to a higher efficiency and greener aircraft operation.

Liebherr-Aerospace announced that the supersonic aircraft company Aerion Supersonic, based in Reno, Nevada (USA) and Melbourne, Florida (USA), has commissioned Liebherr-Aerospace Toulouse SAS, Toulouse (France), Liebherr's center of excellence for air management systems, for the development of the integrated air management system for the AS2 supersonic business jet.

Aerion and Liebherr first began formal collaboration mid-2019, working on preliminary designs of the AS2's integrated air management system. Following the initial technical discussions, Liebherr-Aerospace and Aerion converged on a next generation electrical pack with an integrated air management system.

The electrical air-conditioning pack, under development for several years at Liebherr-Aerospace, is a major step towards greener aircraft operation. In lieu of the traditional methods of utilizing bleed air from the aircraft's engines, the innovative design selected by Aerion draws ambient air from an inlet located on the leading edge of the wing strake, enabling electrically powered compression. Fuel consumption due to the air-conditioning packs will thus be considerably reduced compared to current bleed air systems.

"Developing an air management system, which is to perform at supersonic speed comes with many challenges that we intend to work through with the Aerion team. Liebherr has a decades long experience on air and thermal management systems for both commercial and military platforms, that we can contribute for the benefit of the AS2", explained Francis Carla, Chief Technology Officer of Liebherr-Aerospace & Transportation SAS.

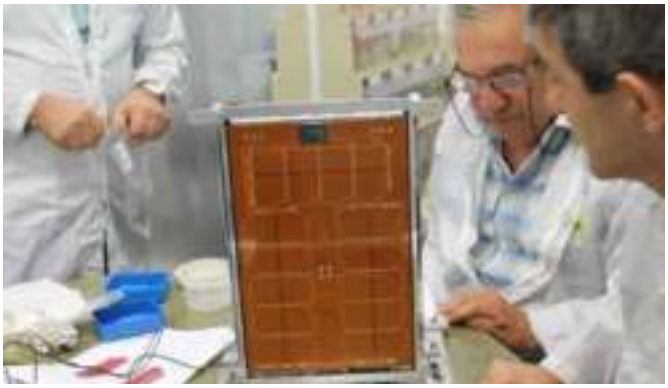
"We are seeking innovative, technology-led partners at the top of their fields who are passionate about accelerating the evolution of human mobility while at the same time being kind to our planet. I am confident that in Liebherr-Aerospace we have found such a partner who will support bringing the AS2 to production," said Tom Vice, Aerion's Chairman, President & CEO.

Aerion's pursuit of faster point-to-point travel begins with the launch of the AS2 supersonic business jet that will commence production in 2023. Designed to be inherently environmentally responsible from first flight, the AS2 is the first supersonic aircraft designed with the ability to accept 100% synthetic fuel and reach supersonic speeds without the need for an afterburner.

The AS2 will be the first aircraft to be assembled at Aerion's new global headquarters called "Aerion Park" in Melbourne, Florida (USA). The state-of-the-art development, powered by clean energy, will incorporate headquarters operations plus an integrated campus for research, design, build and support of the company's new supersonic aircraft.

Technion and IAI Co-Develop New Satellite Technology for Search, Rescue, and Signal Detection Missions

The collaboration yielded an Innovative Electronic Receiver and Satellite Computer for the ADELIS-SAMSON Project; Three Nano-Satellites are to Perform Autonomous Formation Flight



A close technological and research collaboration between the Technion - Israel Institute of Technology and Israel Aerospace Industries (IAI) has yielded an advanced electronic receiver that constitutes a unique development in the nano-satellite category. The collaboration was part of Technion's " ADELIS-SAMSON" project, in which three nano-satellites will be launched into space in December. The three satellites, which will fly in an autonomous formation without human intervention, are tasked with receiving signals from Earth and detecting their precise location for search and rescue, remote sensing, and environmental monitoring missions. The software and algorithms that control the flight were developed at Technion's Distributed Space Systems Lab in the Asher Space Research Institute.

The electronic receiver, developed and built especially for the " ADELIS-SAMSON" project by ELTA Systems, an IAI division and subsidiary, picks-up, identifies, and records signals from Earth. It comprises an information processing system that calculates the location of the transmission. The miniature system was developed particularly for nano-satellites in order to extend the scope of the missions they can perform. The system integrates with the three mission computers developed by IAI's MABAT Division.

The " ADELIS-SAMSON" project is headed by Professor Pini Gurfil, head of the Asher Space Research Institute and a faculty member in Technion Faculty of Aerospace Engineering and with the support of the ADELIS Foundation and the Israel Space Agency in the Ministry of Science and Technology

"We worked closely with IAI engineers on this development for more than five years," said Prof. Gurfil. "The project showcases the benefits of academy-industry collaboration, which yielded an outstanding result in the form of an innovative space-borne system. We thank IAI engineers for their professionalism and commitment. The system we co-developed places ADELIS-SAMSON at the forefront of nano-satellite technology."

IAI CEO, Nimrod Sheffer, said, "The new development will help promote a new space research area. Collaboration with the Technion and other academic institutions is invaluable to us, as it promotes academic research and our future technological ventures. The receiver developed for this project offers a new way for space geo-location of ground electromagnetic signals. It is based on IAI's extensive engineering know-how and experience in satellites, electronic warfare, intelligence interpretation systems, and communication networks."

Alcon selected by BASE to become Partner for Specialist Vehicles

Alcon Components Ltd, world-class specialists in brake and clutch systems, has been selected by BASE, the Turkish manufacturer of complete drivetrain packages including independent suspension drive axles, transfer cases as well as rolling chassis solutions to become their preferred supplier of specialist vehicle braking systems. Under this partnership, Alcon will provide BASE with bespoke solutions to meet the demanding requirements of specialist axles for use in harsh environments such as off-highway, defence, security and other demanding applications. The partnership will also be working on new technology areas such as hybrid and all-electric vehicle installations.

With braking being such an important part of an integrated independent suspension axle system, Alcon's proven track record in both off the shelf and bespoke designed specialist braking systems will see them being involved from concept through design, development and test, to manufacture and support. Already working together on some undisclosed defence and security vehicle projects, BASE and Alcon will ensure the braking performance and technical parameters of the axle system are met with an integrated and fully compliant braking solution.

Alcon braking solutions have been sought out by some of the world's finest specialist vehicle and axle manufacturers. Aside from Alcon's iconic motorsport business, 4 major axle manufacturers have selected Alcon to deliver bespoke specialist

braking systems including BASE, Meritor and PRM Newage. On the vehicle side, over 20 specialist OEMs are currently using or assessing Alcon braking systems, including Patria, Supacat, BAe, Ricardo and Jankel. Across these specialist axle and vehicle markets, design and manufacturing companies are turning to Alcon for the delivery of bespoke braking systems that fully meet their demanding requirements.

Collins Aerospace Announces Digital Terminal Control System Contract for ADF

Collins Aerospace Systems, a unit of Raytheon Technologies Corp. (NYSE: RTX), has been awarded a contract extension by the Australian Defence Force (ADF) worth about $1M to provide ongoing in-country support for the Digital Terminal Control System (DTCS).

The DTCS is a targeting system utilised by Joint Terminal Attack Controllers (JTACs) and Joint Forward Observers (JFOs) to request and coordinate offensive support missions delivered by land, sea or air platforms. Collins Aerospace has been supporting the DTCS in Australia for the past decade.

"This award extension demonstrates our continued utilisation of in-country capabilities to support local defence programs in Australia," said Sonny Foster, managing director of Collins Aerospace in Australia. "We look forward to providing the ADF with subject matter expertise that leverages a decade of sustained knowledge developed in Australia by Collins Aerospace."

The DTCS contract extension will last until June 2021 and will be predominantly executed at Collins Aerospace's Sydney facility to provide ongoing support to in-service DTCS and support for future system risk reduction activities.

Collins Aerospace Systems is a leader in technologically advanced and intelligent solutions for the global aerospace and defense industry. Collins Aerospace has the capabilities, comprehensive portfolio and expertise to solve customers' toughest challenges and to meet the demands of a rapidly evolving global market. With 2019 net sales of approximately $26 billion, the business has 78,000 employees across more than 300 locations globally. It is one of the four businesses that form Raytheon Technologies.

GRSE launched the Portable (Assault) Bridge

Garden Reach Shipbuilders and Engineers through its Bailey Bridge division has designed and developed a new "Portable (Assault) Bridge". This bridge is made of Carbon Fibre Polymer Composite Material and can be used by pedestrians & light vehicles.

Apart from shipbuilding & ship repair, GRSE is the only Defence Shipyard to have diversified into Engineering Business with a product profile of Pre-fabricated Steel Bridges. Bailey Bridge Unit of the shipyard is engaged in designing, developing and installing bailey bridges to far flung areas& terrain in India and abroad having delivered over 5300 Bailey Bridges to Indian Army, BRO, Central and State PWDs and also friendly neighbourhood countries like Bhutan, Nepal, Sri Lanka and Myanmar.

The features and advantages of this new assault bridge is that, it has a span of 30 ft (9.15 m), width of 2.10 m and weight of 336 kg. It also has a load capacity of IRC-6, 400 kg/sqm (Foot Bridge) & 1.10 MT of ATV.The bridge is Man – Portable and reusable using Crew of 10-12.

Garden Reach Shipbuilders and Engineers has been at the forefront of the nation's maritime progress aimed towards self reliance in the sixty years since its inception in 1960 with the delivery of the first Indigenous warship of independent India in 1961, INS Ajay, a Seaward Defence Boat for the Indian Navy. The shipyard has delivered 105 warships to the Indian Maritime Forces, the highest deliveries by any shipyard in the country, till date.

GRSE has undertaken major modernisation of infrastructure at its Main Unit with modular integrated construction technology. Celebrating the "Atmanirbhar Bharat Abhiyaan", a State-of-the-Art Modern Hull Block Complex and Indigenous Underwater CNC Plasma Cutting Facility was virtually inaugurated by Defence Minister Rajnath Singh at the Rajabagan Dockyard Unit of GRSE on 10 Aug 2020 to augment the existing infrastructure at the Main Unit of the shipyard.Thus a step towards concurrent construction of 24 ships from the existing capacity of 20 has been initiated. GRSE has a dedicated, multi disciplinary, strong Design Team which is continuously working towards developing various concept designs for ships, deck machinery items and pre fabricated bridges that can cater to the current and future requirement of its existing and prospective customers in India and friendly foreign countries.

Russian Helicopters Presents New High-Speed Rotor Blades for Combat Helicopters

The Russian Helicopters holding company (part of RostecState Corporation), presented new fully composite rotor blades designed to increase the maximum speed of Mi-28 and Mi-35 combat helicopters at the International Military-Technical Forum ARMY-2020.

The blade possesses modern aerodynamic characteristics and elastic composition; it is manufactured using the technology of one-stage compression molding. It was tested as part of the flying laboratory of a new high-speed helicopter concept.

"During the testing, the flying laboratory based on Mi-24 helicopter equipped with a set of new blades, reached a speed of more than 400 km/h without the needto change the base helicopter design. At the same time, we managed to maintain low vibration and load levels, which speaks of the high potential of this design", noted the Director General of Russian Helicopters, Andrey Boginsky.

The new rotor blades are currently undergoing factory flight tests on a Mi-28N helicopter.

JSC "Russian Helicopters", a part of Rostec State Corporation, is a leading player in the global helicopter industry, the sole Russian designer and manufacturer of helicopters. The Holding Company was established in 2007 and is headquartered in Moscow. We operate five helicopter assembly plants, two design bureaus, component production and maintenance enterprises, aircraft repair plants and one helicopter service company providing after-sales support in Russia and abroad. The customers of the Holding Company are the Ministry of Defense, the Ministry of Home Affairs, EMERCOM of Russia, and other state customers, Gazpromavia, UTair Aviation company, large Russian and foreign companies.

State Corporation Rostec is one of the largest industrial companies in Russia. It unites more than 800 scientific and industrial organizations in 60 regions of the country. Its key areas of activity are transport engineering, electronics, medical technology, chemistry and innovative materials. Rostec holdings form three clusters: electronics, weapons and aviation. The company is a key provider of Smart City technology, it is engaged in the digitalization of public administration, industry and social sectors, and it is developing plans for the development of 5G wireless technologies, an Industrial Internet of Things, big data and blockchain systems. Rostec partners with leading world manufacturers such as Boeing, Airbus, Daimler, Pirelli and Renault. The corporation's products are delivered to more than 100 countries worldwide. Almost a third of the company's revenue comes from the export of high-tech products.

Further Boost to 'Make in India'; MoD Signs Contracts Worth Rs 2580 Cr with Indian Companies for Army

Providing further boost to the 'Make in India' initiative of Government of India in the Defence Sector, Acquisition Wing of Ministry of Defence (MoD) has signed contracts with M/s. Bharat Earth Movers Ltd. (BEML), M/s. Tata Power Company Ltd. (TPCL) and M/s. Larsen & Toubro (L&T) for supply of Six Pinaka Regiments to the Regiment of Artillery of the Indian Army at an approximate cost of Rs. 2580 Crores.

These Six Pinaka Regiments comprise 114 Launchers with Automated Gun Aiming & Positioning System (AGAPS) and 45 Command Posts to be procured from M/s TPCL and M/s L&T and 330 Vehicles to be procured from M/s BEML. These Six Pinaka Regiments will be operationalised along the Northern and Eastern Borders of our country further enhancing the operation preparedness of our Armed Forces. Induction of Six Pinaka Regiments is planned to be completed by 2024.

This project under Buy (Indian) categorisation, with 70% Indigenous Content, has been approved by Defence Minister Rajnath Singh and Finance Minister, Nirmala Sitharaman.

The Pinaka Multiple Launch Rocket System (MLRS) has been indigenously designed and developed by DRDO and productionised by the above-mentioned defence industries. This is a flagship project showcasing public private partnership under the aegis of Government of India (DRDO & MoD) enabling "Aatmnirbharta" in cutting edge Defence technologies.

Keel Laid for the 3rd Stealth Grigate of Project 17A

Keel laid for the third ship (Yard- 12653) of the prestigious P17A class stealth frigates at Mazagon Dock Shipbuiders by Vice Admiral S R Sarma – COM & CWP&A of the Indian Navy and V L Kantha Rao Additional Secretary (Defence Production). The keel laying ceremony was conducted through an e-platform in the presence of Vice Admiral R B Pandit, Chief of Staff, HQWNC and Vice Admiral Narayan Prasad (IN Retd.) – CMD MDL.

Seven frigates under P17A series will be constructed of which four are being constructed in MDL and three in GRSE with MDL as the lead yard. The P17A class frigates are being built using indigenously developed steel and fitted with weapons and sensors along with Integrated Platform Management System. These ships are having stealth features.

Construction of P17A ships differ in the very concept of warship building by way of adoption of the modern technology 'Integrated Construction (IC)' where the blocks are pre-outfitted before joining to reduce the build period of warships. When commissioned the platforms will enhance the combat capability of the Indian Naval fleet.

The function was attended by Rear Admiral G K Harish, DGND, Commodore T V Thomas (IN Retd.), Director (CP&P), MDL, Rear Admiral A K Saxena (IN Retd.), Director (Shipbuilding), Commander Jasbir Singh (IN Retd.), Director (S&HE), MDL, Sanjeev Singhal, Director (Finance), MDL , Mahesh Chandra, CVO, MDL along with senior executives from MDL & Navy through an e-ceremony including the Warship Overseeing Team.

Raman R is GM (Internal Audit) at BEL

Raman R took charge as General Manager (Internal Audit) of Navratna Defence PSU Bharat Electronics Limited (BEL). He was Additional General Manager (Internal Audit) at BEL-Corporate Office prior to his elevation.

A postgraduate in Commerce and Fellow Member of the Institute of Chartered Accountants of India, Raman joined BEL on July 17, 1989, as Accounts Officer. He started his career, making significant contributions in almost all areas of Finance & Accounts working at BEL's Corporate Office and International Marketing Division.

In August 2010, he was transferred to BEL's Bangalore Complex, where he worked for about a decade, in various capacities and in many Strategic Business Units (SBUs) such as Military Communications (Milcom), Naval Systems (Radar & Fire Control Systems), Missile Systems and Central Finance.

Raman has spearheaded the formulation of BEL Executives' Pension Scheme and was instrumental in BEL bagging its first national award from ICWAI, New Delhi, for "Cost Management" during FY 2005-06.

US and Israel Flight Tested Arrow 2 Weapon System

United States and Israel have successfully completed a Flight Test of the Arrow 2 Weapon System. Israel Defense Minister Benny Gantz said, our 'elite technological unit' ensures that we will always be one step ahead of our enemies."

The Israel Missile Defense Organization (IMDO), of the Directorate of Defense Research and Development (DDR&D), in the Israel Ministry of Defense, together with the American Missile Defense Agency (MDA), and the Israeli Air Force (IAF), have completed a successful test of the Arrow-2 weapon system overnight (12.8), at 11:45 p.m. The test was led by Israel Aerospace Industries (IAI) and conducted at a site located in central Israel.

Throughout the test, the Arrow-2 system successfully engaged a Sparrow target missile, which simulates a long-range surface-to-surface missile. The campaign was conducted in accordance to the defense establishment's plans.

Defense Minister, "Israel must face challenges both near and far, and our 'elite technological unit' led by the DDR&D, IAI, and additional defense industries, ensures that we will always be one step ahead of our enemies, and that we will defend Israeli skies from any threat."

The joint Israeli - American test reflects the partnership and friendship between the two countries as well as the deep commitment of the United States to the safety of the citizens of Israel. We will continue to work together to strengthen the capabilities of the defense establishment in the air, land and sea, as well as in cyberspace.

During the test, the updated capabilities of the Arrow system to contend with current and future threats, were validated. The interception was conducted by IAF service members together with engineers from the institutions involved in the system's development. The various layers of Israel's air defense mechanism were employed in this test, in order to ensure their readiness and efficacy in operational scenarios.

Ulan-Ude Aviation Plant Launches Certified Process Simulation Facility

The Ulan-Ude Aviation Plant of the Russian Helicopters holding (part of the Rostec State Corporation) has launched a certified process simulation facility in its premises. The facility works as a platform for interactive training by the principles of lean production, and was created at the enterprise as part of the Russian governmental project for improving labor productivity and employment.

"Factory specialists were the first in the region to receive certificates and the right to train employees of enterprises participating in the Labor Productivity and Employment program." Opening of the process simulation facility at U-UAP was an result of effective interaction between the Ministry of Economy of the Republic of Buryatia and the Russian Federal Center of Competences in Labor Efficiency, which provided methodological assistance in its creation", - pointed out the Managing Director of JSC U-UAP Leonid Belykh.

The training platform allows to conduct interactive workshop training for employees. The facility reproduces a real mechanical engineering production chain and simulates real production processes.

The training format consists of eight-hour business game, in which a team of 15 people gets acquainted with methods for identifying losses and determining reserves in workflow optimisation. Its unique format allows the process simulation facility to quickly teach crucial skills associated with the lean production approach.

The simulator provides an opportunity to consciously apply lean production tools to increase labor productivity, gain practical experience and knowledge about improvements in the production process that can affect the operational and economic performance of an enterprise. ■

Elbit Systems UK Demonstrates Hermes 900 for the Maritime and Coastguard Agency

Elbit Systems' Hermes 900 Unmanned Aerial System (UAS) recently successfully completed a series of flight demonstrations for the Maritime and Coastguard Agency (MCA). The demonstrations were run by the MCA and were designed to test the capabilities of using a UAS to enhance Search and Rescue (SaR) capabilities and the use of long-range unmanned capabilities in civilian airspace.

Taking place off the West Coast of Wales over the first two weeks of September, the Hermes 900 was able to fly advanced Beyond Line of Sight (BLOS) missions into unsegregated and uncontrolled airspace, in full alignment with the UK Civil Aviation Authority (CAA). The success of these trials is a significant step forward in enhancing the capabilities of the MCA as they seek to improve the efficiency and effectiveness of its search and rescue operations while reducing the risk to MCA personnel in the field. Elbit Systems UK is closely collaborating with the UK Civil Aviation Authority, supported by additional UK companies, including Inzpire and Aviation Systems Group.

In the recent demonstration, the Hermes 900 equipped with search and rescue specific radar, an Automatic Identification System (AIS), EO/IR payload, an Emergency Position-Indicating Radio Beacon (EPIRB) and full satellite communications, was deployed on a range of missions that simulated shore-line rescues, water rescues in dangerous air space and long-distance ship rescues which crossed international air space lines.

With a wingspan of 15m, the 1.2 ton, Hermes 900 is already deployed with more than a dozen advanced customers around the globe providing search, rescue and reconnaissance capabilities. The Company offers extended life-saving capabilities with its recently launched Hermes 900 Maritime Patrol configuration with inflated life-rafts for detection, identification and saving the lives of survivors at sea. It was revealed that this configuration was delivered to an undisclosed customer in South-East Asia.

Martin Fausset, CEO of Elbit Systems UK commented: "We are pleased to have had the opportunity to showcase our enhanced search and rescue capabilities to the MCA this week. The Hermes 900 is perfectly equipped to deal with the needs of the Maritime and Coastguard Agency and we are proud to be able to support them as they continue with their vital, life-saving work."

Director of HM Coastguard Claire Hughes said: "We continue to do all we can to use existing technology as well as look to the future in our ongoing work of saving lives at sea. Remotely piloted aircraft continue to be a big part of that work both to potentially save lives in search and rescue and protect our beautiful coastlines from the worst effects of pollution." ■

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M V Raja Sekhar Takes Charge as Director (R&D) of BEL

M V Raja Sekhar took charge as Director (R&D) of Navratna Defence PSU Bharat Electronics Ltd (BEL) on September 1, 2020. He was Chief Scientist of BEL's Central Research Laboratory (CRL)-Bangalore, and Officer on Special Duty (OSD) at BEL's Corporate Office, before his elevation.

Raja Sekhar joined BEL's Ghaziabad Unit on February 1, 1985, as Probationary Engineer after completing B.Tech in Electronics & Communication Engineering from Sri Venkateswara University, Tirupati. He was involved in the testing of Communication products such as Static and Digital Mobile Tropo-scatter Communication & Satcom Networks, Radar Displays and Command & Control Systems during his tenure at BEL's Ghaziabad Unit. In the year 2000, he moved to Hyderabad Unit and worked on the testing and commissioning of various Electronic Warfare systems. In 2004, he was transferred to Machilipatnam Unit.

During his tenure at Machilipatnam Unit, Raja Sekhar contributed to the design and development of Night Vision Devices which have been supplied in large quantities to the Ministry of Home Affairs and the Indian Army. He has established a good design base for BEL in IR Optics and initiated signal processing development at CRL-Bangalore. He was instrumental in the indigenous development of state-of-the-art Thermal Imager-based Sights and Systems in association with IRDE (DRDO) which resulted in significant business growth for the Company.

In May 2016, he was promoted as Chief Technology Officer (Electro Optics & Lasers). As CTO (EO&L), he initiated many new projects in Electro-Optics and Lasers at BEL's Product Development & Innovation Centre (PD&IC), complementing the efforts of Unit D&Es and CRL-Bangalore. He was a guiding force for the scientists of CRL-Bangalore and PD&IC for the development of Fiber Laser Technology in strategic alliance with the Indian Institute of Science, Bangalore, and Central Glass and Ceramic Research Institute (CGCRI).

In June 2019, he moved to CRL-BG as Chief Scientist and led a team of around 260 scientists working on diverse technologies such as Artificial Intelligence, Robotics & Drones, Cyber Security, Cloud & Data Analytics, Tactical Communications, Radar Signal & Data Processing, EO&L, Smart Computing Devices, Embedded Systems, Networking Devices and Systems and Advanced Signal Processing for EW & Acoustics, before his elevation as Director (R&D).

BIRD Aerosystems Won Contract to Upgrade Czech Air Force AMPS Fleet

BIRD Aerosystems, the leading developer of Airborne Missile Protection Systems (AMPS) and Airborne Surveillance, Information, and Observation (ASIO) solutions, has won a new contract to upgrade and improve the AMPS systems of the Czech Air Force.

BIRD's AMPS are installed on the Czech Air Force Mi-17 helicopters and successfully and operationally deployed in different dangerous and complicated conflict zones, including Afghanistan. The overall program includes an upgrade to the MILDS UV detection sensors and the MCDU Mission computers provided by BIRD Aerosystems as well as provision for future installation of BIRD's MACS (Missile Approach Confirmation Sensor).

"We see this as a sign of proof for the operational value that BIRD's AMPS bring to the customer and are honored that the Czech Air Force chose to conduct an upgrade to the systems it is using for several years, in order to align with the latest developments and ensure optimal protection for its soldiers and personnel. BIRD's AMPS were deployed in various missions, including missions in Afghanistan – where the Czech Air Force was operating as part of the NATO forces." Said Ronen Factor, Co-Chief Executive Officer and Founder at BIRD Aerosystems. He added: "We believe that this overall improvement will allow the Czech Air force to keep focusing on important operational missions while knowing that their force is protected."

BIRD Aerosystems' Airborne Missile Protection System (AMPS) provides the most enhanced protection for military and civilian aircraft against all known Surface to Air Missiles (SAM), including MANPADS, Laser Beam Rider threats, and radar-guided missiles. AMPS automatically detect, verify, and foil SAM attacks through the effective use of countermeasure decoys (Flares and Chaff) or DIRCM that jam the missile's IR seeker and protects the aircraft. AMPS is provided as a turn-key solution that includes installation design, installation, integration, certification, and support, and is certified by leading aircraft manufacturers.

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IAI makes history with its Heron UAV Landing in Airport via Remote Control

The Heron UAV is the first in the world to land at an international airport and integrate into the airspace alongside commercial flights.

The Heron, a UAV developed and built by Israel Aerospace Industries (IAI), landed at Ben Gurion International Airport, becoming the first UAV to land in an international airport alongside commercial flights occupying civilian air space. The UAV took off from Ein Shemer airfield, landed at Ben Gurion, and flew back to Ein Shemer. The entire takeoff, flight, and landing were operated from the Ein Shemer control station.

This historic landing proves the maturity and safety of IAI's Long Runner operating system, which allows UAVs to take off and land automatically on long-haul routes (ranges of up to 1500 km and more) using satellite communications technology and a combination of accurate take-off and automatic landing capability.

The Heron has an extensive operational record during the many years it's been in use by the Israeli, German, and other nations' air forces and is designed to carry out longer strategic and tactical missions. It can withstand severe weather conditions, carry multiple payloads (sensors), and transmit real-time information to the forces and decision-makers in the field. The Heron UAV can carry cargo up to 290 kg and can be used for a range of civilian purposes as well.

IAI EVP and General Manager of the Military Aircraft Group, Moshe Levy, said, "IAI's Heron UAV made a significant breakthrough today, landing for the first time at an international airport. The future of the world of aviation will need to allow unmanned aerial vehicles to land at civilian airports, and today this happened for the first time thanks to the hard and joint work of the Civil Aviation Authority of Israel and the Israel Airports Authority. This is a great acheivment for IAI in the UAV arena."

Indian & U.S. Defence team Conduct Virtual Discussion on Cooperation

The 10th Defense Technology and Trade Initiative (DTTI) Group Meeting was held virtually was co-chaired by Raj Kumar, Secretary, Defence Production, from the Indian Ministry of Defence and Ellen M. Lord, Under Secretary of Defense for Acquisition and Sustainment, from the U.S. Department of Defense. DTTI Group Meetings are normally held twice a year, alternating between India and the United States.

The aim of the DTTI Group is to bring sustained leadership focus to the bilateral defense trade relationship and create opportunities for co-production and co-development of defense equipment. Four Joint Working Groups focused on land, naval, air, and aircraft carrier technologies have been established under DTTI to promote mutually agreed projects within their domains. The groups reported to the co-chairs on ongoing activities and collaborative opportunities including a number of near-term projects targeted for completion on priority.

As evidence of their commitment to demonstrating the success of DTTI, the co-chairs signed a Statement of Intent (SOI) that declared their intent "to strengthen our dialogue on defense technology cooperation by pursuing detailed planning and making measurable progress" on several specific DTTI projects.

The co-chairs were also pleased to note that since the last DTTI Group meeting in October 2019, a DTTI Standard Operating Procedure (SOP) for the identification and development of cooperative projects under DTTI has been completed. The SOP will serve as the framework for DTTI and allow both sides to reach and document a mutual understanding on how to define and achieve success. A publicly releasable extract of key elements of the SOP was also published in July as the DTTI Initial Guidance for Industry, and distributed through Indian and U.S. industry associations.

Further efforts to encourage U.S. and Indian industry to cooperatively develop next-generation technologies under the DTTI Group were highlighted by the 1st DTTI Industry Collaboration Forum (DICF), which took place virtually on September 10, 2020. The DICF was convened by Sanjay Jaju, Joint Secretary (Defence Industries Production), Michael Vaccaro, Director, International Armaments Cooperation, and Amy Murray, Director, Small Business Programs. This forum offers an opportunity for Indian and U.S. industry to be directly involved in DTTI and facilitates dialogue between government and industry on issues that impact industrial collaboration. The results of the discussion were briefed to the DTTI Group co-chairs.

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MTU Aero Engines AG Feels the Effects of the Coronavirus Pandemic in the First Six Months

In the first six months of 2020, MTU Aero Engines AG generated revenue of €2,048.8 million; in the first half of 2019 revenue was €2,243.0 million. Operating profit[1] was €224.2 million, compared with €365.2 million in the prior-year period. The EBIT margin was 10.9% in the first six months of 2020 (1-6/2019: 16.3%). Net income[2] declined from €261.0 million to €161.3 million. "The figures reflect the first effects of the coronavirus pandemic," said Reiner Winkler, CEO of MTU Aero Engines AG. "A better estimate of the quantitative impact of the coronavirus crisis is now also possible. On Friday, we therefore issued new guidance for 2020." MTU now expects to generate revenue of around €4 to €4.4 billion in 2020. In percentage terms, the company anticipates an organic decline in the mid to high twenties in the commercial series production business and in the high twenties in the spare parts business. In the commercial maintenance business, an organic revenue reduction in the low to mid-single-digit percentage range is expected. Revenue in the military engine business should grow slightly. MTU is forecasting an adjusted EBIT margin of between 9% and 10% for 2020. Adjusted net income should develop in line with EBIT. Furthermore, MTU has set itself the goal of closing the year with a positive free cash flow.

Revenue from the commercial maintenance business was stable at €1,272.3 million in the first six months (1-6/2019: €1,287.3 million). The main revenue driver was the V2500 for the classic A320 family, followed by the PW1000G-JM for the Airbus A320neo, where MTU registered an increase in shop visits in connection with the retrofit program. "This work could offset the decline in revenue in the core business," explained Winkler.

In the commercial engine business, revenue fell from €773.0 million to €630.6 million. "The figures reflect the reduction in aircraft production rates and the decline in aircraft deliveries," said Winkler. The main revenue drivers were the V2500, the PW1100G-JM and the GEnx, which is used in the Boeing 787 and 747-8 models.

In the military engine business, the three-week suspension of operations in April was the main reason for the drop in revenue to €183.2 million (1-6/2019: €216.0 million). The main source of revenue was the EJ200 Eurofighter engine.

The order backlog at the end of the first six months remained high at €18.4 billion (December 31, 2019: €19.8 billion). Most of these orders relate to the V2500 and the Geared Turbofan™ engines of the PW1000G family, in particular the PW1100G-JM for the A320neo.

MTU's earnings declined considerably in the first half of 2020, especially in the OEM business, where adjusted EBIT fell from €242.5

Industry Focuses on Climate-Neutral Aviation

The focus of the aerospace industry is on climate-neutral aviation. The recently concluded ILA Goes Digital – the world's first and to date most successful digital aerospace show – as well as the #AeroDays2020 and the Berlin Aviation Summit in November make up three high-level international event that are dedicated to this important topic.

"The coronavirus pandemic has resulted in the aerospace industry facing its worst crisis. The aim now is to overcome the crisis and secure the survival of this vital economic sector", said Volker Thum, Managing Director of the German Aerospace Industries Association (BDLI). "At the same time we are confronting the industry's biggest long-term challenge: climate-neutral aviation. At the digital ILA we took important steps, laying down markers for this goal. In November the European #AeroDays2020 will follow. At this event, the most important high-level meeting of its kind in Europe, the aim is to drive forward aviation technology, innovation and research. Kicking off the event here in Berlin will be the Berlin Aviation Summit".

Digital ILA paves the way for climate-neutral aviation

Following the cancellation of ILA 2020, the leading platform for innovation in aerospace, due to Covid-19, the BDLI and Messe Berlin immediately launched ILA Goes Digital. From 13 May to 31 July over 120 exhibitors highlighted how the goal of climate-neutral aviation can be achieved by 2050. The European research programme Clean Sky 2 showed how innovative technologies can be employed to substantially reduce emissions. MTU Aero Engines, Rolls-Royce and Avio Aero demonstrated how revolutionary propulsion concepts of the future will contribute significantly to attaining that goal.

ILA Goes Digital sets a new standard for digital trade shows

Over the last few months the digital ILA has set a new standard. More than 120 exhibitors and close to 30,000 visitors from around the world took part in the digital ILA. ILA content was viewed and shared thousands of times on LinkedIn and Facebook. The event reached tens of thousands of users on Twitter alone and the hashtag #ilagoesdigital was retweeted thousands of times. This shows that despite the crisis and restrictions there is great demand for discussing important topics via new, dynamic formats.

#AeroDays2020 discuss strategies and technologies for restarting international aviation

The next important event for the future of civil aviation will soon be taking place from 24 to 26 November. At this event, the most important high-level meeting of its kind in Europe, the aim will be to jointly develop strategies for the "new normal" in aviation and to drive forward research, innovation and technology as key elements of a sustainable, digitalised and competitive aerospace industry. The event will bring leading figures from research, politics, industry, the financial world and energy companies together in Berlin during Germany's tenure of the EU council presidency. Kicking off the #AeroDays2020 on 24 November will be the Berlin Aviation Summit (BAS), the "Davos of aviation". Over the next two days of the innovation platform that is the #AeroDays2020 FORUM, discussions will take place on the technological feasibility of those strategies.

million to €128.1 million. MTU spent €98.1 million on research and development in the first half of 2020 (1-6/2019: €112.0 million). "We are actively preparing for the future through our research and development and our activities are focused on emission-free aviation," reported Winkler. In line with this, MTU has concentrated its R&D activities on the ongoing development of the Geared Turbofan™ programs and future enhancements, technology studies for next-generation engine design, and digitalization of engine manufacturing processes.

The free cash flow was €125.2 million as of June 2020 (1-6/2019: €235.4 million). CFO Peter Kameritsch: "Safeguarding our liquidity position still has top priority for us. We were able to increase our financial headroom considerably in the first half of the year: We increased our liquidity reserves to around €1.5 billion." To this end, MTU increased the existing revolving credit facility by €100 million to €700 million and successfully placed a €100 million promissory note and a Eurobond with an aggregate principal amount of €500 million.

The net cash outflow for property, plant and equipment was €63.0 million in the first half of the year, compared with €99.0 million in the prior-year period.

BEML High Mobility Vehicle with Pinaka Rocket Launcher System

BEML Bags Rs 842 Cr High Mobility Vehicles order for Pinaka projects from MoD

BEML LIMITED, the leading Defence equipment manufacturer and a 'Schedule A' Company under the Ministry of Defence received a prestigious order from MoD for supply for 330 High Mobility Vehicles, for Pinaka Project at an approximate cost of Rs 842crore.

Pinaka is a multi-barrel rocket launcher developed indigenously for the Indian Army and produced in India by involving Public Sector and Private Sector Defence Industries. The multi-barrel launcher system is mounted on the highly rugged BEML truck, much acclaimed for its off-road mobility and would provide the Indian Army with vital manoeuvrability on the battlefield.

This order is a big boost to BEML, involved in the manufacturing of the High Mobility vehicles with superior features under the 'Make in India' programme, thus demonstrating BEML's efforts under the 'Aatmanirbhar Bharat' initiative. The equipment will be manufactured at BEML's Palakkad Plant in Kerala and would supply the vehicle platform to MoD in a span of three years.

"We are proud to support MoD under the 'Make in India' project for supply of 330 BEML Heavy Duty Trucks for the Pinaka regiments that will further enhance the combat capabilities of the Indian Army. BEML signifies the true spirit and is an enabler for 'Atmanirbhar Bharat'," Dr. Deepak Kumar Hota, CMD, BEML Limited.

Sampathkumar Takes Charge as CTO (Communication) of BEL

P Sampathkumar has taken charge as Chief Technology Officer (CTO-Communication) of Bharat Electronics Ltd (BEL). Earlier he was working as Additional General Managerof BEL's Design & Engineering Division (D&E) of Military Communication (Milcom) Strategic Business Unit (SBU) at Bangalore, and AGM (Production-Milcom)/BEL-Bangalore.

Sampathkumar joined BEL's Bangalore Unit on December 1, 1986, as Probationary Engineer after completing BE in Electronics & Communication Engineering from the College of Engineering, Guindy, Anna University, Chennai. In a career spanning over the last 33 years, he has worked in various capacities and gained rich experience in diverse technologies of BEL.

He was involved in the Production & Testing of Communication products and setting up of Automatic Testing Equipment (ATE) facilities for various types of Military Communication equipment during his early days at BEL's Military Communication & Electronic Warfare SBU. He also gained domain expertise in testing of Fire Control Radars working as Testing Engineer.

During his tenure in D&E, Sampathkumar contributed to the design and development of portable and static HF Radios, which have been supplied in large numbers to the Ministry of Home Affairs and also exported. He has established a good design base for BEL in RF Design, Power Amplifier and Antenna Tuning Unit in Military Communication. He was instrumental in the indigenous development of Software Defined Radio (SDR), in collaboration with DRDO labs DEAL and CAIR, which resulted in significant business growth for the Company.

His D&E team received the prestigious Raksha Mantri Award in 2010 for the development of encryption HF Radio. Mr Sampathkumar also won the BEL R&D Award twice for his design efforts. He initiated the development of many new Military Communication projects to address the requirements of Army, Navy, Air Force and Paramilitary Forces. From December 2019, as AGM (Production-Milcom)/BEL-Bangalore, he steered manufacturing of various types of Radios for Tactical, Shipborne and Missile applications. He also played a key role in the CV 200 Ventilator project before his elevation as CTO (Communication).

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MoD Appoints KPMG Led Consortium on Corporatisation of OFB

An Expression of Interest cum Request for Proposal (EOI cum RFP) for engaging a Consultancy Agency for providing strategic and implementation management consulting services to assist the Ministry of Defence in the process of corporatisation of the Ordnance Factory Board was issued by the Department of Defence Production .

Consequent to evaluation of the Technical and Financial proposals of the bidders, the Department has selected M/s KPMG Advisory Services Pvt. Ltd. (Lead Consortium Member) with M/s Khaitan & Co. Ltd. as Consortium Member, as the Consultancy Agency for the said project. The contract with the Consultancy Agency would be signed shortly and subsequently, the Consultancy Agency would commence its services as per the Terms and Conditions of the contract.

Collins Aerospace Eliminates the Need for Touching Airport Kiosks with New Mobile Phone Check-in

- **New solution enables passengers to use their personal phones to control airport kiosks**
- **No app installation necessary and simple to implement for airports and airlines**
- **Collins Aerospace is now the first to offer a full contactless experience through airports**

Collins Aerospace Systems, a Raytheon Technologies business (NYSE: RTX), is eliminating the need to physically touch kiosk screens during airport check-in and baggage drops. The company's new Kiosk Connect solution provides the first full, end-to-end, contactless airport journey — a high demand as passengers return to travel.

By simply scanning a QR code with their mobile device, passengers can quickly connect to a common use kiosk using either the airport's public Wi-Fi or the kiosk's built-in Wi-Fi, with no requirement to download any apps. From there, users complete the check-in process on their phones and produce boarding passes and bag tags without ever touching the kiosk screen.

"When combined with our secure biometric solutions and self-service airport products, this new feature enables travelers to experience a contactless airport journey all the way from check-in to boarding," said LeAnn Ridgeway, vice president and general manager, Information Management Services for Collins Aerospace. "As we work to help the aviation industry rebuild passenger confidence in flying, it's incredibly important to us to provide solutions to improve safety and which are easy to use."

Collins Aerospace's ARINC SelfPass™ system is able to complete a passenger's contactless journey through the use of a single token ID driven by secure biometrics. SelfPass can be applied to multiple points in the process, including check-in, immigration and security, lounge access and boarding. Each step can be completed in a matter of seconds with no need to present traditional boarding and identification documents. Air travelers simply step up to the camera for a facial match against the biometrics database then proceed.

Collins Aerospace Systems, a unit of Raytheon Technologies Corp. (NYSE: RTX), is a leader in technologically advanced and intelligent solutions for the global aerospace and defense industry.

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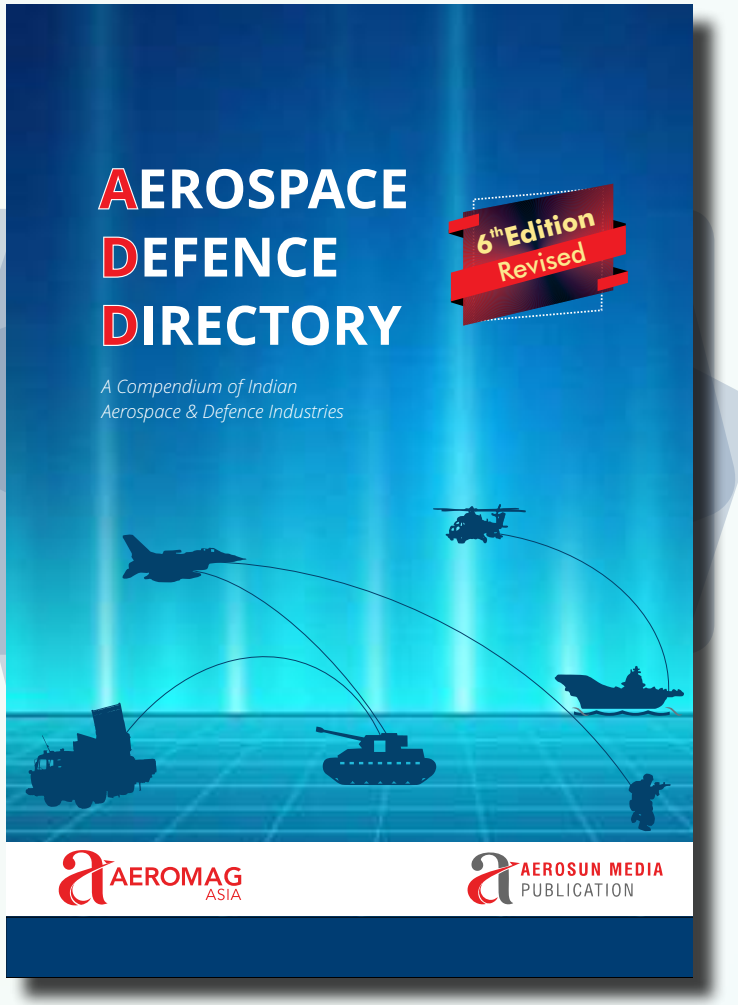

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