

समाचार पत्रों से चयित अंश Newspapers Clippings

दैनिक सामयिक अभिज्ञता सेवा
A Daily Current Awareness Service

Vol. 45 No. 29 08-10 February 2020



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‘ We must work today to develop technologies of tomorrow ’

At DefExpo 2020, Defence Research and Development Organisation (DRDO) Chief G Satheesh Reddy spoke to Ajai Shukla about the ‘Make in India’ initiative

How will multiple agencies —the DRDO, defence public sector undertakings (DPSUs), private industry, and academia —function cooperatively?

In the ‘Make in India’ programme, the role of DRDO is to support industry with technologies that are, as far as possible, developed within the country. These must be transferred to the industry so that they are not reliant on outside technologies. Most technology transfer that happens is “manufacturing technology.” There is very little transfer of “know how” and “know why”. In contrast, technology developed by the DRDO has been completely developed in house and in the country. This has involved knowledge debate within academia, within R&D organisations and within industry. So the DRDO must focus on developing as many critical technologies as possible and transferring them to the industry.

Meanwhile, the industry’s role should not be that of a mere producer. It must upgrade skills from “build to print” (i.e. translate blueprint into a product) to “build to specs” (translate product specifications into a blueprint, and thence into a product). That would take much of the development load off the DRDO, which can then concentrate on developing core technologies.

Today, if we want to satisfy the armed forces, or to address the export market, we need to make systems that incorporate state-of-the-art technologies. So we must work today to develop the technologies of tomorrow, in order to become state-of-the-art.

India has been mostly a technology follower. Weaponry and products come to us and then, years later, we try to develop the technologies in those. That has to change, and we have to become a technology leader, or at least contemporary. I cannot sell a system that incorporates decade old technology.

Given that we are technology followers, isn’t this going to take a long time?

No. In some technology areas, we are very strong. For example, we already have all the technologies that are needed in missile systems. Today, we can develop any missile system that may be required. Similarly, in radar technology, we are completely self sufficient. Even industry is equipped and experienced to support us in this field. We are also strong in fields like sonar, torpedoes, electronic warfare systems, airborne warning and control systems (AWACS) and artillery guns.

In building these systems we operate at the technology frontier. We are amongst the six or seven most advanced nations in these areas. So, in these areas, we should think innovatively about what will be required after five years and start developing that today. In five years, we could have a technologically leading, first of its kind system.

Who should be responsible for this technology anticipation and planning?

It has to be a combination of R&D organizations and academia, with inputs from the armed forces.



Under someone like the DRDO Chairman, or the scientific advisor to the government?

We already meet regularly and talk to the armed forces for drawing up its LTIPP (long term perspective plan). We also take feedback from what basic research applied research and we try and shape the country scientific and technological capability. We formal body for we have prepared roadmap in DRDO these discussions. Each of the DRDO's laboratories has a technology roadmap and all of this comes together in the larger assessment.

In developing weapons platforms in India, traditionally the DRDO has functioned as a systems integrator. Do you believe it should concentrate on developing core technologies, while capable private firms take on the role of systems integrators?

Absolutely. The days when DRDO used to be systems integrator have gone. Already, some DPSUs have begun functioning as systems integrators and soon private industry will also do systems integration. We have brought in a concept called DCPD —development cum production partner.

This involves selecting a private firm as the DCPD, who joins on Day 1 of the project and works and learns with the DRDO. The firm then becomes the when the manufacturing partner when the product goes into production.

But in the model you describe, DRDO seems to be the lead integrator...

No, the private firm is the integrator; the DRDO only oversees. The first time it will be difficult for him to be the lead integrator. For example, in a missile system, we would oversee the working of our DCPD. By the end of the development phase, the firm will have absorbed the technology and developed capability. The DCPD manufactures the system, so there is a smooth induction into service in large numbers.

With the DPSUs not having functioned well as production partners, is it time to give private firms greater opportunities as production partners?

I believe DPSUs and private industry can coexist. There is an excellent model for cooperation in the Akash missile, for which the military has placed ~25,000crore orders. Bharat Dynamics is the lead agency, but 85 per cent of the production value has gone to private industries as tierI, -II, and -III suppliers.

But is private industry confined to the role of lower order suppliers?

No. The Akash missile has four sections and there are private firms that supply an entire section, fully integrated with all its electronic and mechanical packages. There is a tierised production chain that enables BDL to produce a significant number of missiles every month. There is space for both public and private firms to operate. We cannot just close a DPSU. And, when we give the job of lead production agency to a private firm, there is a need to protect the tier-I, -II, and -III suppliers. Otherwise, MSMEs will vanish.

https://www.business-standard.com/article/economy-policy/we-must-work-today-to-develop-technologies-of-tomorrow-drdo-chief-12002100011_1.html

Sat, 08 Feb 2020

DEFEXPO 2020: DRDO hands over licenses for ToT to 17 industries

The partnership with DRDO is expected to provide impetus to further boost the development of the defense production corridor in Uttar Pradesh

Lucknow: In DEFEXPO 2020, during the MoU signing ceremony titled 'Bandhan', DRDO handed over 15 licenses for ToT (LATOT) to 17 industries on DRDO developed technologies. This would enhance cooperation and synergy between industry and Government organisations. The technologies transferred are from the area of electronics, laser technology, armaments, life sciences, materials science, combat vehicles, naval systems, aeronautics, sensors, etc. These products are Mine Field Marking Equipment MK-II (MFME MK-II), e-Nasika, DMS HIDDEN Fuel-I, Bi-Modular Charge System (BMCS), 500kg General Purpose Bomb, 250kg Pre Fragmented Bomb, Electronic Fuze for 81mm Mortar Bomb, Post Impact Delay Fuze for Air Delivery Bomb, Vehicle Mounted ECM System, IR Flare for CMDS, Process Monitoring of Vacuum Assisted Resin Transfer Moulding (VARTM), Man mounted cooling system, Optical Target Locator 600 (OTL 600), High Power Li-ion Battery Technology (HPLBT) and Combat Free Fall (CFF) Parachute System. These high technology products will boost the defense manufacturing sector with self-reliance and enhance the operational capabilities of the Armed Forces.

In a big push to the Uttar Pradesh defense corridor, Uttar Pradesh Expressways Industrial Development Authority (UPEIDA) signed a Memorandum of Understanding (MoU) for knowledge partnership with Defence Research & Development Organisation (DRDO). The partnership with DRDO is expected to provide impetus to further boost the development of the defense production corridor in Uttar Pradesh.

The MoU was exchanged between Dr. G Satheesh Reddy Secretary DD(R&D) and Chairman DRDO and Shri Awanish Kumar Awasthi, CEO, UPEIDA.

Speaking on the occasion, the Hon'ble Raksha Mantri lauded the efforts of DRDO and further expressed his happiness in achieving the record transfer of 114 technologies to the industries in the last one year. He also said that the industries have been benefitted with the efforts put in by DRDO through TDF and the free patent which is available to the industries coupled with availability of test facilities, which as a whole are the confidence-building measures which need to be fully exploited by the industries to propel the nation forward towards self-reliance. The Hon'ble Raksha Mantri also lauded the MoU between DRDO and UPEIDA and told that this will facilitate technical and knowledge support by DRDO to the corridor to facilitate a well-planned and efficient industrial base that will lead to increased defense production in the country. The Hon'ble Raksha Mantri announced that DRDO will provide technical and handholding support to industries for export of DRDO developed products and also handholding support for innovation and R&D by industries. He expressed that our defense equipment manufacturing should be explored to tap the global market as well. Efforts should be made to increase the export market for defense equipment. He concluded by saying that we all must work for the success of all the Bandhan initiatives"

Yogi Adiyath said that the Signing of MoU with the DRDO will be a step forward towards achieving the ultimate aim of capability-building and indigenous production of defense equipment. He also welcomed the announcements by Shri Rajnath Singh of bringing out the new industry-friendly defense technology-related DRDO policies. The Chief Minister further expressed his confidence that

the MoU with DRDO will extensively benefit in the development of the State of Uttar Pradesh as well as the region in particular.

Dr. G Satheesh Reddy brought out that DRDO will provide all technical support for the development of the defense corridor as this will give thrust to the "Make-In-India" programme under the guidance of Raksha Mantri Shri Rajnath Singh and envisioned by the Prime Minister Shri Narendra Modi. Dr. Reddy elaborated that the recent success of DRDO products such as Anti-Satellite (A-SAT) Missile, Man-Portable ATGM, Naval LCA, Naval Torpedo Varunastra, Radars, Sonars, Advanced materials have not only made country more self-reliant in defense technology but also provided immense opportunities to the industries in defense manufacturing sector. He further stressed the point that the industries are invaluable partners and it is an apt time for the Indian industry to take advantage of the latest policies of the Government and further steer the country by enhancing the efforts towards self-reliance through indigenous technologies, job creation, and Nation building.

In this program, Hon'ble Raksha Mantri Shri Rajnath Singh, Chief Minister Uttar Pradesh, Shri Yogi Adityanath, Minister of Industrial Development, Government of Uttar Pradesh, Shri Satish Mahana, Shri Ajay Kumar, Defence Secretary, Shri Shripad Yesso Naik, MoS (Defence), Chief of Army Staff, General Manoj Mukund Naravane, PVSM, AVSM, SM, VSM, ADC, Dr. G Satheesh Reddy, Secretary DD(R&D) and Chairman DRDO, Shri Awanish Kumar Awasthi, CEO, UPEIDA, Additional Chief Secretary, Government of Uttar Pradesh along with officials from MoD and UP Government and industrialists from entire country were present. Raksha Mantri Shri Rajnath Singh and Chief Minister Uttar Pradesh, Shri Yogi Adityanath were the chief guest and guests of honor respectively for this event. (With Inputs from PIB)

<https://www.devdiscourse.com/article/business/865822-defexpo-2020-drdo-hands-over-licenses-for-tot-to-17-industries>



Sat, 08 Feb 2020

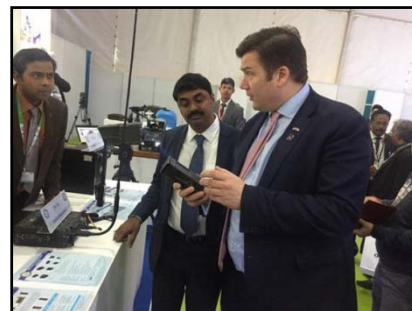
UK Minister Heapey interacts with DRDO Chairman at Defence Expo

Dr. Reddy briefed the Minister about various technology developments at DRDO and the latest products showcased at the DRDO Pavilion, Defence Expo – 2020

New Delhi: James Heapey, Hon'ble Minister of Defence Procurement UK visited DRDO pavilion and interacted with Dr. G Satheesh Reddy, Secretary DDR&D and Chairman, DRDO on February 6th, 2020.

Dr. Reddy briefed the Minister about various technology developments at DRDO and the latest products showcased at the DRDO Pavilion, Defence Expo – 2020.

The Minister showed keen interest in Nirbhay Missile and its capabilities. He was impressed with DRDO products namely AEW&C, Air and Naval versions of AMCA, Trainer Aircraft, and LCA Mk II. He inquired about the re-fuelling capabilities of these aircraft and appreciated the efforts done by DRDO during the discussions.



The Minister also visited the Electronics & Communication Cluster Products SWATI Weapon Locating Radar, Night Vision Devices, Laser Ordnance Disposal System (LORDS), Optical Target

Locator. The Minister was thrilled to experience the demonstration of the LCA MK II cockpit simulator. Also high-resolution video & images from Night Vision devices developed by DRDO.

Secretary DRDO briefed him about the latest developments of missiles for Indian Armed Forces viz. ASTRA, LRSAM, NAG, and HELINA.

Secretary DRDO expressed to UK Minister about his views that Indian and UK Research departments should identify at least five futuristic technology areas for collaboration also agreed to set up a task force to initiate and take up Joint R&D Projects within 3 months time.(With Inputs from PIB)

<https://www.devdiscourse.com/article/business/865812-malaysia-sovereign-fund-asks-news-website-to-stop-reports-on-airline-sale>



Sat, 08 Feb 2020

Rustom-II UAV, loaded with new features, set to fly soon

By Anantha Krishnan M

Lucknow: An upgraded version of Rustom-II (Tapas) - the medium-altitude long-endurance (MALE) unmanned aerial vehicle (UAV) - being developed by Aeronautical Development Establishment (ADE), is ready to take to the skies soon.

The new platform (AF-6A) being readied for its first flight will be seventh one from Rustom-II flight line. The sixth prototype (AF-6) of Rustom-II had crashed near the Aeronautical Test Range (ATR) in Chalakere (Chitradurga district, Karnataka) on September 17, 2019. (AF stands for air frame.).

ADE is a Bengaluru-based Defence Research and Development Organisation (DRDO) lab working on unmanned platforms and subsonic cruise missiles. Rustom-II, when inducted into the armed forces, will undertake surveillance and reconnaissance missions.

Rajnath inspires

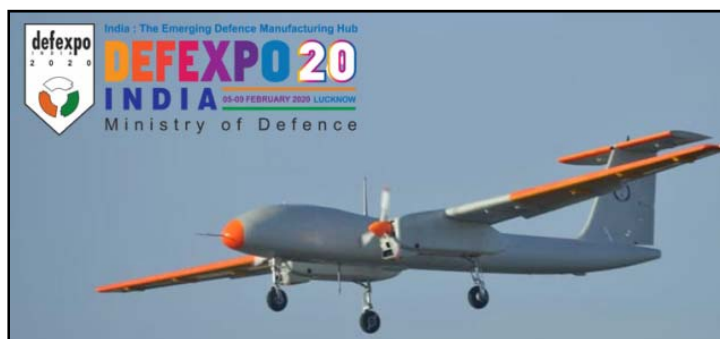
It is now confirmed that the crash was due to the momentary and simultaneous link loss that prompted the UAV to enter into the 'return home mode.' The platform also had to encounter a rough patch of turbulence beyond the capacity of control law, resulting in the crash.

The behaviour of the UAV is being claimed to have been on the expected lines and as per the design parameters. The sensor data was available for the ground station almost till its touchdown\crash.

A scientist who is part of this project told Onmanorama that the Rustom-II team got a pep-talk from Defence Minister Rajnath Singh two days after the crash, during his visit to Bengaluru.

"He had come to visit the Tejas facilities and subsequently had undertaken a sortie on the same on September 19. Our team was called to meet him and he wanted us to resume the flight immediately," says a scientist.

The defence minister gave the team 15 days to get the UAV back into action.



"We had the 5th aircraft (AF-5) from the flight line flying on October 3, putting behind all the setbacks. The project team rose to the occasion and commenced the flying," says the scientist.

Added might

The seventh platform (AF-6A) from Rustom-II flight line set to undertake its maiden flight carries many new features. From AF-5 prototype onwards (February 2018), Rustom-II is being powered by a 180 HP Austro engine, replacing the 115 HP Rotax engine.

Among the new features embedded into the system are: a solid state relay-based low weight power distribution unit; an indigenous inertial navigation system (INS) developed by RCI, Hyderabad; Lithium ion batteries and satellite communication (SATCOM) link.

The major surveillance payloads that are now being flown are electronic intelligence (ELINT), communications intelligence(COMINT), Synthetic Aperture Radar (SAR) and long\medium range electro optical (EO) systems.

DRDO carried out the first test flight of Rustom-II prototype in November, 2016 at the ATR. Till date, it has completed 77 development flights, including seven, post its crash.

A total of 15 platforms are being planned during the development phase, out of which last five will be the production versions. These five will be handed over to the users for their independent evaluations. Hindustan Aeronautics Limited will manufacture the last five variants and the scientists are working on to optimizing the design from AF-8 to AF-10.

The state-of-the-art ground control station (GCS) and image exploitation system have added more teeth to the mission. The GCS is said to have been appreciated by the UAV operators from the armed forces.

Weight reduction

Indian Army is the major stakeholder in the Rustom-II mission with a requirement for 60 platforms, followed by the Indian Air Force (12) and the Indian Navy (four).

Backed by a young team with an average age of 35 years, Rustom-II core project team consists of 30 scientists and engineers.

With overweight being a curse for most of the desi aeronautical platform, ADE now promises to shred the 'unwanted mass' of Rustom-II by 260 kgs, when the new platform kisses the skies.

Weight reduction process for data link and payloads are currently on for future prototype.

DRDO Chairman Dr G Satheesh Reddy had told Onmanorama at DefExpo2020 that delays are now being dealt with priority. "Some of our recent missions are good examples as to how speed has become our mantra now. Things have changed a lot compared to past," he claims.

<https://english.manoramaonline.com/news/nation/2020/02/08/rustom-ii-uav-loaded-with-new-features-set-to-fly-soon.html>

DRDO chief bats for indigenous tech

Space scientist launches electric scooter by start-up incubated at IIT-Hyderabad

SPECIAL CORRESPONDENT
SANGAREDDY

The government wants to increase indigenous production in the defence sector up to 70% and reduce imports, said Defence Research and Development Organisation (DRDO) chairman G. Sathesh Reddy.

He, along with NITI Aayog member V.K. Saraswat, launched the EPluto 7G vehicle by Pure EV in the premises of the Indian Institute of Technology, Hyderabad (IIT-H), on Sunday.

Addressing the gathering, Mr. Reddy said they are looking for innovations in defence technology and are ready to support them.

Many start-ups have emerged in the past four years, he said while recalling



IIT-H Director B.S. Murty, NITI Aayog member V.K. Saraswat, DRDO chief G. Sathesh and Pure EV founder Nishant Dongari.

the instance of a young entrepreneur's material technologies idea.

The DRDO chief also mentioned that a proposal for 1,000 e-buses manufacturing plant near Hyderabad is under active consideration.

Mr. Saraswat said during 2020-2021, five to six 2 GWh battery manufacturing

plants would come up and the NITI Aayog was ready to encourage those who come up with proposals.

He said India is also considering getting lease of lithium mines abroad so that manufacturing cells will be easy, which costs 40% of the battery, in India.

He also advised Pure EV to

join hands with the International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI).

Pure EV CEO Rohit Vadera said EPluto 7G has a range of 116 km per full charge and runs with a maximum speed of 60 kmph. Battery warranty is for 40,000 km.

He said the company presently has 50 outlets and they are going to increase it to 200 by the end of this year. The vehicle has been designed to suit Indian terrain and weather conditions.

Nishant Dongari, IIT-H associate professor and founder of Pure EV, said the battery technology was patented and they have state-of-the-art facilities for the assembly and testing of the lithium battery packs.

The Indian EXPRESS

Sat, 08 Feb 2020

DRDO brings missiles, indigenous tech

The Anti-Satellite (ASAT) missile — successfully tested last year, making India only the fourth country to successfully attack satellites — is attracting a lot of attention. So are the Akash Missile systems and the tanks

By Krishn Kaushik

Lucknow: The DRDO installations at the DefExpo 2020 in Lucknow have proven to be among the largest crowd-pullers. The Anti-Satellite (ASAT) missile — successfully tested last year, making India only the fourth country to successfully attack satellites — is attracting a lot of attention. So are the Akash Missile systems and the tanks.

However, the installations are not restricted only to its defence systems — it has also brought some of its latest technologies that will be used by the country's armed and paramilitary forces not just in combat zones, but also in counter-intelligence, surveillance and sanitisation operations.

While some of the technologies displayed are ready to be inducted, others are still at the trial stage, and a few others are still at the proposal stage.

Among the installations is that of its latest Daksh robot, also called the Unexploded Ordnance Robot. The Daksh Defuser, DRDO scientists said, is the world's first machine that can not only handle unexploded bombs remotely, but can also defuse them. Scientists said that the machine can be operated from a distance of up to 2 km, and while one arm of the machine can extricate a bomb from the ground, another arm can defuse or cut it.

<https://indianexpress.com/article/india/drdo-brings-missiles-indigenous-tech/>



Sat, 08 Feb 2020

Defexpo 2020: DRDO says ASAT weapon system is 'ready for further limited production'

By Rahul Udoshi

Lucknow: Officials from India's state-owned Defence Research and Development Organisation (DRDO) have said that the anti-satellite (ASAT) weapon system tested by New Delhi in March 2019 is now "ready for further limited production".

However, speaking to *Jane's* at the 5–9 February Defexpo exhibition in Lucknow, the officials pointed out that any decision on the further production will have to come from the Indian government.

The ASAT weapon demonstrated its capabilities as part of 'Mission Shakti' when it was used to shoot down an Indian satellite. According to data provided by the DRDO, the 18.87 tonne, three-stage interceptor missile – a 1:1 scaled model of which was displayed at Defexpo 2020 – features two-stage solid-propulsion rocket motors with flexible nozzles, and a kill vehicle.

The first stage takes the missile, which is 13.164 m long and 1.4 m in diameter, to a designated altitude with an average thrust of 43.1 tonnes for a burn time of 74.8 seconds, after which the second stage ignites, providing an average thrust of 20.8 tonnes for a burn time of 37.7 seconds.

The missile uses inertial navigation with target updates for mid-course guidance and an imaging infrared seeker for terminal homing. The weapon is designed for engaging low-Earth orbit (LEO) targets travelling at a maximum velocity of 8 km/sec, within a maximum kill altitude up to 1,000 km and downrange of 700 km.

The system has five operational stages: the ground-based identification and tracking of the target, the missile launch, the separation of the head shield, the missile's lock-on to the target, and the engagement of the target.

https://janes.ihs.com/Janes/Display/FG_2695598-JDW

Sat, 08 Feb 2020

Defexpo 2020: DRDO developing extended-range variant of Prahaar CRBM

By *Rahul Udoshi*

Lucknow: India's state-run Defence Research and Development Organisation (DRDO) is developing an extended-range variant of its Prahaar close-range ballistic missile (CRBM) system, DRDO officials told *Jane's* at the 5–9 February Defexpo 2020 exhibition in Lucknow.

Designated Pranash, the 200 km-range weapon "is a tactical surface-to-surface ballistic missile being developed to meet a requirement by the Indian armed forces", the officials said, adding that the missile, which will be powered by a single solid-propellant rocket motor, will be fitted with a conventional warhead.



Development of the Pranash is set to be completed by 2021, after which the weapon will be made available for user trials. The Prahaar missile has a top range of 150 km and has been developed to replace the Prithvi CRBMs.

https://janes.ihs.com/Janes/Display/FG_2695624-JDW



Sat, 08 Feb 2020

DRDO's remote-operated vehicle can diffuse unexploded bombs

The vehicle known as Unexploded Ordnance Robot (UXOR) is part of the display at the DefExpo 2020 in Lucknow

By *Mayank Singh*

Lucknow: Defence Research and Development Organisation's laboratory, Research and Development Establishment (RDE), has come up with a unique solution against the menace of unexploded bombs which can otherwise not only block operations but can also lead to loss of life and property.

"We have manufactured first such vehicle which can not only handle but also diffuse unexploded bombs. It can be remote controlled from a Master Control Station (MCS) from as far as 2-km keeping explosive at a safe distance from handlers," said a senior scientist. It can handle ordnance ranging from a mortar to a 1000-kg bomb, he added.

The vehicle known as Unexploded Ordnance Robot (UXOR) is part of the display at the DefExpo 2020 in Lucknow. It has tracked wheels which makes it compatible for uneven surface and has two arms compatible to pick load with one hand and cut the bomb. "It uses high speed abrasive water jets cutting technology to diffuse the bombs," the scientists said.

DRDO Scientists Mridu Kant Pathak and Dilip Makwana said, “The vehicle is mounted with multiple cameras which let people sitting in MCS to manoeuvre the vehicle to the right spot, understand the type of the ordinance and also to point the jet at the exact place where it can be cut to diffuse the bomb.” The other countries have vehicles used only to pick the bomb and to move it to a safe distance.

The vehicle is powerful enough to pull out unexploded bombs from runway strips.

<https://www.newindianexpress.com/nation/2020/feb/08/drdo-remote-operated-vehicle-can-diffuse-unexploded-bombs-2100622.html>



Sat, 08 Feb 2020

BDL introduces new missile at DefExpo-2020

At the same event, another ammo manufactured by the BDL, namely Varunastra, was handed over to the Indian Navy

Hyderabad: Hyderabad-based missile systems and ammunition manufacturer Bharat Dynamics Limited (BDL) launched its new product, the Amogha-III Anti-Tank Guided Missile, during the Defexpo-2020 at Lucknow on Friday.

According to a press release issued by the BDL, the missile, with a dual-mode IIR seeker, has a range of over 200 to 2,500 metres. Equipped with a tandem warhead, Amogha-III is a top/direct attack missile. It will be commercialised after successful completion of user trials, added the release.

The missile is developed by the BDL with support from the DRDO. The first model of the same was handed over by the CMD of BDL Commodore Siddharth Mishra (Retd) to Defense Minister Rajnath Singh at the event.

Varunastra handed over to the Navy

At the same event, another ammo manufactured by the BDL, namely Varunastra, was handed over to the Indian Navy. The heavy-weight torpedo and underwater weapon developed by the NSTL, DRDO is an advanced ship with a variable speed facility at 20 and 40 knots and is capable of successfully targeting quiet, anechoic submarines operating in shallow/deep waters in an intense Acoustic Counter Measure Environment.

<https://www.newindianexpress.com/states/tehrangana/2020/feb/08/bdl-introduces-new-missile-at-defexpo-2020-2100619.html>

Defence Expo 2020: UP first state to use 19-seater Dornier for commercial flights

Hyderabad-based startup is biggest investor with Rs 38K-cr project, DRDO to set up R&D lab in UP

By Kanchan Srivastava

Lucknow: Uttar Pradesh is going to be the first state to use Hindustan Aeronautical Limited manufactured Dornier aircraft to ferry passengers to small cities. The 19-seater Dornier is currently being used by the Indian Airforce and Coast Guard. “The commercial flights of indigenous Dornier will start this year to connect the state capital Lucknow with Varanasi, Agra, Bareilly and Jhansi among others,” Uttar Pradesh Chief Minister Yogi Adityanath said on Friday speaking to mediapersons at the Defence Expo2020 which is being held in Lucknow 5-9 February.

State has signed an MoU with HAL for two 19-seater Dornier aircraft for commercial purpose on the sidelines of the Defence Expo 2020.

During the Expo, over 200 MoUs were signed. Among them 23 MoUs are exclusively for UP Defence corridor, one of the two defence corridors in India spread across Chitrakoot, Jhansi, Kanpur, Lucknow, Agra and Aligarh. An eight-year-old Hyderabad-based start-up “Titan Aviation and Aerospace Limited” has come up as the biggest investor. The company, in collaboration with multiple Ukrainian companies and a US partner, has proposed Rs38,000 crore project in Jhansi. So far, the company has been in the aviation training only.

Director of the company Dinesh Kumar tells FPJ, “The Jhansi project would have three verticals-first is Skill training, pilot training and leasing of choppers for offshore activities; the second phase would be manufacturing and maintenance facility for aircrafts; third one is production of drones, bullet-proof vests, armoured vehicles etc.”

Up on asking why the company has chosen UP instead of its parent State Telangana, Kumar says, “Telangana doesn't support startups for such a big project.” The 23 proposed projects are likely to bring Rs50,000 crore investment in the state. Yogi said, “Even if 50 percent of the MoUs get materialised, over 2.5 lakh jobs would be created.”

“These projects will require 5,000 acres land which has already been acquired. We have got 12,500 acres of land bank for industrial development. The Defence corridor is being developed with an objective of promoting indigenisation and supporting the `Make in India` initiative towards fulfilling equipment requirements worth over \$250 billion by 2025,” said Yogi.

During the event, Defence Research and Development Organisation (DRDO) signed a Technological partnership agreement with the UP government. G Sateesh Reddy, Secretary, Chairman announced that the DRDO would setup a Research and Development centre in Uttar Pradesh which would act as a catalyst to push defence development.

He adds that technology transfer and DRDO patents are being made available at no cost to companies in order to further the defence ecosystem in the country.

Over 200 partnerships including Transfer of Technology were inked at ceremony tilted “Bandhan”. Defence Minister Rajnath Singh, who presided over the signing ceremony, described the signing of MoUs as a step in the direction to achieve Prime Minister's \$5 billion defence exports target in next 5 years.

<https://www.freepressjournal.in/india/defence-expo-2020-up-first-state-to-use-19-seater-dornier-for-commercial-flights>

DefExpo gives boost to ‘Make in India’

Breakthrough moment for defence sector, says Rajnath

By Ajay Banerjee

Lucknow: A number of people thronged the DefExpo 2020 venue here to get a glimpse of India’s growing defence prowess as the event was opened to public on Saturday. Defence Minister Rajnath Singh termed the event as a breakthrough moment in the field of Indian defence manufacturing sector.

The first three days of the five-day DefExpo were classified as “business days”.

In the first three days, Indian companies not just entered into joint ventures with global companies, but they also announced to buy companies holding critical technologies.

From the Ministry of Defence, missiles and artillery guns made by the Defence Research and Development Organisation (DRDO) and Ordnance Factory Board (OFB) are a success story.

From the latest anti-sat missiles to strike in space to truck-mounted Akash missiles are now made in India. The artillery guns of the DRDO and OFB could mean there would possibly be no more imports.

Away from the public sector giants and well-known tie-ups that Boeing Airbus and Lockheed Martin have in India, new JVs have emerged.

Private sector company Bharat Forge, a major player in the artillery programme, is ambitious. Baba Kalyani, Chairman of Bharat Forge, claims, “We can be the artillery leader by 2030.”

Pavitra Goel, General Manager at Lohia Groups, says, “We have purchased a firm in Israel doing the latest in composites and are now a ‘Tier one’ supplier to an Israel aerospace company.” “We can provide composites for planes and missiles,” added Goel.


Among drones, Adani has tied up with Elbit of Israel for making an anti-drone system.

Noida-based Tak technologies has tied up with Russian partners to undertake indigenous design and development of electro-optical/night vision equipment.

In the field of small arms, Bangalore-based SSS Defence had a range of locally made future infantry small arms and light weapons as well as small and medium calibre ammunition.

Rajnath said DefExpo 2020 not only witnessed participation of a large number of exhibitors, but also forged new partnerships and attracted more than 12 lakh visitors.

<https://www.tribuneindia.com/news/defexpo-gives-boost-to-make-in-india-38026>




THE BRIGHTEST news coming out of Defexpo-2020 was the MoD granting Initial Operational Clearance given to HAL's Light Utility Helicopter. clears the decks for the Bengaluru-based aircraft maker to begin series production of the LUH.

The nimble 3-tonne LUH began development in 2009 and first flew in 2016. In just four years, the machine has proved itself admirably in trials in super-high altitude regions like Leh and the hot deserts.

The LUH will replace the Army and Air Force's fleet of over 200 vintage French-designed Cheetah and Chetak helicopters that have been in service for over 50 years. (Navy Chetaks will be replaced by the Naval Utility Helicopter project being steered under the Strategic Partnership project).

HOMEGROWN TECH SHINES



DRDO chief Satheesh Reddy handing over the Initial Operational Clearance to HAL CMD R Madhavan.

The IAF and the Army need 384 light utility helicopters — at least 184 of these will be

LUH will replace over 200 vintage helicopters

built by HAL and the remaining 200 machines by the Ka-226 being built by an Indo-Russian joint venture. These procure-

ments will of course be dictated by available budgets. In the LUH, born out of the Advanced Light Helicopter project, lies the story of how indigenous technological capabilities when nurtured can shorten development cycles.

This lesson needs to be remembered in aircraft projects like the Light Combat Aircraft that are potential building blocks for future programs.



Sat, 08 Feb 2020

India's Light Utility Helicopter granted initial operational clearance

By Rahul Bedi

New Delhi: India's state-owned Hindustan Aeronautics Limited (HAL) has been granted initial operational clearance (IOC) for its Light Utility Helicopter (LUH), meaning that the company will now begin series-production of the single-engined platform.

Military officials told *Jane's* that the Centre for Military Airworthiness and Certification (CEMILAC) in Bangalore granted the IOC for the indigenously developed LUH following rigorous testing.

HAL said in a 7 February statement that three LUH prototypes had “cumulatively completed” over 550 test flights in diverse climatic conditions, including cold, hot, and humid weather, but did not provide a timeline.

The company stated that the LUH’s “endurance and reliability” were further established after the platform flew for 7,000 km over 17 days from Bangalore to undertake “hot weather and high-altitude trials [in western and northern India] without any abnormalities”.

Under development since 2008, the 3.15 tonne LUH is intended to replace the Cheetah and Chetak helicopters that have been operated by the Army Aviation Corps (AAC) and the Indian Air Force (IAF) since the 1960s.

HAL says that it has confirmed an order for 197 LUHs – 133 for the AAC and 64 for the IAF – which are set to be built at the company’s special helicopter manufacturing facility at Tumakuru, 74 km north of Bangalore.

Powered by a single Shakti 1U turboshaft engine – a derivative of the Shakti (Arididen 1H1) engine developed jointly by HAL and France’s Turbomeca – the LUH has a two-man crew and an operating range of 350 km.

It is intended to be capable of carrying a 500 kg payload at sea level and 75 kg at its operational ceiling of 6,500 m, which renders it capable of operating at the 5,400 m high Siachen Glacier in the Himalayas to service army troops.

The LUH can also ferry troops and cargo, conduct high-altitude casualty evacuations, and transport an underslung load of 1,000 kg.

Fitted with a range of advanced sensors and electronic equipment, it can also be deployed on reconnaissance and surveillance missions and provide combat information for frontline army formations.

https://janes.ihs.com/Janes/Display/FG_2695619-JDW

The Sentinel *of this land, for its people*

Sun, 09 Feb 2020

Light Utility Helicopter gets wings at Defexpo-2020

Lucknow: The single-engine Light Utility Helicopter (LUH) got wings at Defexpo-2020 on Friday after Chairman Defence Research and Development Organisation’s initial operational clearance to Hindustan Aeronautics Limited for its production.

HAL CMD R Madhavan received the initial operational clearance certification from G. Sateesh Reddy, Chairman, DRDO, at the ‘Bandhan’ programme held at the ongoing DefExpo 2020 in the presence of Defence Minister Rajnath Singh and Uttar Pradesh Chief Minister Yogi Adityanath and others.

The move will help armed forces to replace the ageing fleet of Cheetah and Chetak helicopters.

HAL will be manufacturing indigenously designed and developed helicopters that will meet the operational requirements of armed forces.



“This is a momentous occasion for HAL. It reinforces our commitment towards indigenous R&D programmes on self-reliance and enhancing operational effectiveness of the Indian armed forces. HAL is fully geared to fulfil the requirements of its customers in a time-bound manner,” said R Madhavan.

Arup Chatterjee, Director, Engineering & R&D, HAL, said the performance of basic configuration of LUH in all terrains and under all weather conditions is satisfactory and that HAL is moving towards the next phase.

One LUH Prototype is part of flying display and another is part of the static display at the DefExpo 2020.

“Till now three prototypes have been built and cumulatively completed over 550 flights under various terrains and climatic conditions like cold and hot weather, at sea-level and high altitude complying with stringent certification and user requirements,” HAL said.

HAL said the helicopter’s endurance and reliability were established during the hot weather and high-altitude trials wherein LUH was ferried from Bengaluru, covering over 7000 km and continuously flying for 17 days without any abnormality. (IANS)

<https://www.sentinelassam.com/national-news/light-utility-helicopter-gets-wings-at-defexpo-2020/>

THE TIMES OF INDIA

Sat, 08 Feb 2020

UP signs 23 MoUs with pvt cos, Rs 50k-cr windfall for def corridor

By Neha Lalchandani

Lucknow: The Uttar Pradesh government on Friday signed 23 MoUs with private companies and PSUs, which could bring investments of up to Rs 50,000 crore into the state’s defence corridor. The ongoing Defence Expo, where these MoUs were inked, is being touted as one of the biggest held so far with over 200 MoUs already been signed between governments, private companies and other organisations.

Ajay Kumar, secretary defence, said in the previous Defence Expo, 40 MoUs had been signed and a target of 100 had been set for the ongoing expo. “However, not only did we meet this target, we exceeded it by 100%. These also include the launch of 30 products during the expo,” he said.

A major MoU signed by the UP government included one with DRDO, which has come on board as knowledge partner with UPEIDA for development of a defence corridor in the state. DRDO chairperson Dr G Satheesh Reddy said: “It is our duty to ensure that the corridor comes up. We will support UPEIDA in skill development and hand holding in technical areas. We will also establish a cell to coordinate with the government and once the corridor comes up, we will also establish an R&D centre.”

Other than the UP specific MoUs, 68 more MoUs were signed for defence-related collaboration. Along with launches of 30 products, there were six major announcements in the defence sector and 18 transfers of technology. An Initial Operational Clearance certificate of Light Utility Helicopter (LUH) was also issued to Hindustan Aeronautics Limited during the ceremony. The LUH will work as a replacement for the Cheetah and Chetak helicopters, which are currently being operated by Indian Armed forces.

BDL launched the Amogha-3, an anti-tank guided missile, and the Varunastra, an anti-submarine torpedo manufactured under the technological guidance of DRDO, while OFB launched the “Sharang”, a 155mm artillery gun with a 36 km range and handed over a model to Chief of Army Staff Gen M M Naravane.

Defence minister Rajnath Singh said that India should move towards becoming a net defence exporter in the coming years. “These MoUs are a step towards achieving the target of making India a \$5 billion defence exporter in the next five years. UP itself will emerge as defence manufacturing hub in coming years. The liberalised licence regime that has been brought in by the Narendra Modi-led government will definitely attract large investments by both Indian and global companies,” he said.

<https://timesofindia.indiatimes.com/city/lucknow/up-signs-23-mous-with-pvt-cos-rs-50k-cr-windfall-for-def-corridor/articleshow/74017028.cms>

OBN

For the Community, By the Community

Sun, 09 Feb 2020

Defense Expo 2020 combat app will prevent soldiers from committing suicide – Combat app will stop troopers from suicide, DRDO created, each soldier will probably be monitored

By Abigale Lormen

The rising despair and suicidal tendencies within the troopers will quickly cease. For this, Defense Institute of Psychological Research (DIPR) of Defense Research and Development Organization (DRDO) has created Combat App.

Through this, modifications within the temper of the troopers may be consistently monitored. Currently the trial of this app is being executed at Army War College Mhow. It is getting constructive outcomes.

It is being reported within the corridor quantity eight of the Defense Expo. DIPR analyzes and explores the temper of troopers working in an uneven state of affairs.

In this sequence, the institute has created Combat app to cut back despair in troopers and forestall suicidal tendencies. This app has options to maintain a relentless watch on the temper of the three military personnel and officers.

The technical officer of DIPR, Shubham, stated that by taking the thoughts of the troopers and officers from the Combat app, needed steps are being taken of their curiosity. Counseling then helps in getting them out of despair.

According to a report, 437 army personnel dedicated suicide within the final 4 years. These embody 340 Army, 18 Navy and 79 Air Force personnel and officers. While solely 237 jawans and officers died throughout this time within the conflict. In this fashion, the dying of army personnel within the nation is much less in conflict, however greater than suicide.

CPSS replaces PABT

Several a long time previous Pilot Aptitude and Battery Test (PABT) within the Flying Branch of the Airforce, Army, Navy and Coast Guard has been changed with Computerized Pilot Selection System (CPSS).

The CPSS consists of superior flight simulation gear, cockpit, monitor and radar management exams. It is designed maintaining in thoughts the superior fighter plane like Sukhoi and Tejas. It has additionally been made by DIPR.

<https://ourbitcoinnews.com/defense-expo-2020-combat-app-will-prevent-soldiers-from-committing-suicide-combat-app-will-prevent-soldiers-from-suicide-drdo-created-every-soldier-will-be-monitored/>

Defense Expo 2020 Marksman will give reply to stone pelters – Defense Expo 2020: 'Marksman' will give smashing stoneback

By Abigale Lormen

Marksman has been ready to cope with the issue of stone pelting in Kashmir. It solutions the stone with a laser. As quickly because the laser is forged, the eyes of the stone bearers and darkness falls. They are compelled to flee from the spot.

Marksman is featured within the Static show of the Defense Expo. Where the viewers additionally photographed on Saturday. It additionally grew to become a middle of attraction. It has been ready by the joint efforts of DRDO and Mahindra.

Mahindra designed the automobile, whereas DRDO fitted all army gear. DRDO scientist Manmohan informed that this car has been named Marksman. It is totally bulletproof. It is utilized in locations the place the gang has turn into uncontrolled.

He additional defined that lathi cost remains to be on the miscreant crowd. Tear gasoline is launched or water canon is used. But now they're compelled to retreat with out hurting them with the assistance of this Marksman.

The car creates a big laser spot and falls on individuals's eyes. They cease showing for some time. Meanwhile, the police get an opportunity to catch the protesters.

Not solely this, if a demonstrator is hidden, then it helps to seek out his identify simply. He additionally stated that it has not but been allowed to make use of it in Kashmir. It is getting used within the Northern Command of the Army.

<https://ourbitcoinnews.com/defense-expo-2020-marksman-will-give-reply-to-stone-pelters-defense-expo-2020-marksman-will-give-smashing-stoneback/>



DRDO inks deal with Russian company for missiles propulsion systems

DRDO's High Energy Materials Research Laboratory (HEMRL) signed contract with Rosoboronexport for development of Advanced Pyrotechnic Ignition Systems. Director HEMRL KPS Murthy said that this will enable advancement in the field of energetic materials and pyrotechnic technology leading to the development of advanced ignition systems

Lucknow: The Defence Research and Development Organisation (DRDO) signed a technology development contract with a Russian company Rosoboronexport on Friday at DefExpo2020 here.

DRDO's High Energy Materials Research Laboratory (HEMRL) signed contract with Rosoboronexport for development of Advanced Pyrotechnic Ignition Systems.

Director HEMRL KPS Murthy said that this will enable advancement in the field of energetic materials and pyrotechnic technology leading to the development of advanced ignition systems.

HEMRL is the DRDO laboratory working in the development of spectrum of high energy materials required for missiles, rockets and guns.

This will meet the futuristic requirements of high-performance propulsion systems. He added that the propulsion systems are the power behind the rockets and missiles.

"This technology development will facilitate design and development of the state of art solid rocket motors for upcoming products," Murthy said.

These products will be based on compact and energy efficient propulsion systems.

<https://economictimes.indiatimes.com/news/defence/drdo-inks-deal-with-russian-company-for-missiles-propulsion-systems/articleshow/74001438.cms>



Sat, 08 Feb 2020

20 Tejas a year possible: HAL Chief

Says BrahMos missile can be mounted on Tejas

By Ajay Banerjee

Lucknow: In what could change the dynamics of Indian military equipment-making market, the BrahMos missile could possibly be mounted on the Tejas fighter jet. Both are made in India.

The Hindustan Aeronautics Limited (HAL) is working to mount the much-talked about missile with the Tejas. The Chairman-cum-Managing Director of HAL, R Madhavan, on being asked if it was possible to fit the BrahMos on to the Tejas, said "Yes, it's possible." He had an exclusive chat with The Tribune on Friday on the sidelines of the DefExpo here.

On being asked if there was an expression of interest from BrahMos, Madhavan said "Yes. But we have not planned it as yet, but are thinking on those lines (to mount the missile on the jet)".

The BrahMos may need another modification as the Tejas is smaller than the Sukhoi Su-30MKI. The missile may need to be lighter and dimensionally smaller.

The CMD of the public sector giant, on being asked if his company could make 20 Tejas per annum, said "easily". He said ramping up production is not a big issue. The production line is fixed as per the number of order. As of now we have only 40 Tejas on order. Once we get the order of the next 83 Tejas Mark 1A jets, we are geared up to make 16 planes and ramp it up to 20 per year.

The production speed depends upon the size of the order. Setting up a new line costs Rs 1,500 crore. With ramped up production, we can do the 83 Tejas Mark 1A jets within four years.

On advanced light helicopter (ALH) Dhruv, Madhavan said: "As of now we have order of 70 ALHs. Some 300 are already in service. "We are now aiming for more civil market operations", he said, adding that copters are needed for immediate rescue and emergency situations.

On the light combat helicopters, he said, negotiations are in advanced stages to supply 15 such copters, 10 for the Army and five for the IAF.

<https://www.tribuneindia.com/news/20-tejas-a-year-possible-hal-chief-37648>

नवभारत टाइम्स

Mon, 10 Feb 2020

भरेगा सेना का टैंक

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■ नई दिल्ली : भारतीय सेना की ताकत बढ़ा रहे टी-72 टैंक की पावर अब स्वदेशी इंजन बढ़ाएंगे। डिफेंस रिसर्च एंड डिवेलपमेंट ऑर्गनाइजेशन (डीआरडीओ) ने टी-72 टैंक के लिए स्वदेशी इंजन बनाया है। यह इंजन 1000 हॉर्स पावर का है। स्वदेशी इंजन के जरिए टैंक की रफ्तार भी बढ़ेगी, साथ ही वह ज्यादा वजन के साथ भी चल सकेगा। इस इंजन की पहले लैब टेस्टिंग की गई जिसमें यह सफल रहा। यह -5 जैसे ठंडे इलाके और 53 डिग्री जैसे गर्म इलाकों में काम करेगा। साथ ही बहुत ज्यादा धूल भरी जगहों में भी बेहतर तरीके से काम कर सकता है।

यह एक बड़ी उपलब्धि है कि टी-72 इंजन प्रोग्राम अब पूरी तरह से स्वदेशी हो गया है। सूत्रों के मुताबिक इसे हमारे एक पड़ोसी देश को भी बेचने के तैयारी है। उनके पास भी टी-72 टैंक हैं और यह बातचीत चल रही है कि उनके टी-72 टैंक का इंजन भारत में अब



इस स्वदेशी इंजन से बदला जाएगा। टी-72 इंजन का मूल उत्पादक देश रूस है।

टी-72 टैंक का इंजन 1000 हॉर्स पावर का है। यह ज्यादा वजन के साथ भी तल सकेगा

अभी तक इसके इंजन भारत में लाइसेंस के तहत बनते थे। लेकिन अब डीआरडीओ ने स्वदेशी इंजन बना लिया है। लाइसेंस पीरियड खत्म हो गया है और भारत को इसे बनाने की इजाजत मिल गई है। टी-72 टैंक में स्वदेशी इंजन से खर्चा भी कम होगा। जहां पहले इस पर तीन करोड़ तक का खर्चा आता रहा है वहीं स्वदेशीकरण होने से यह खर्चा घटकर 85 लाख से 1 करोड़ के बीच होगा।

Army reluctant to buy India-made Arjun tank, prefers Russian T-90S

The army continues to block the indigenous Arjun tank even though, in a comparative trial, conducted in the Rajasthan desert in March 2010, the Arjun proved equal to, or better than, the Russian T-90S

By Ajai Shukla

New Delhi: Although “Make in India” has been the central motif of the on-going Defexpo 2020 in Lucknow, the army continues to block further purchases of the Arjun main battle tank (MBT), years after it has met all the army’s ever-increasing demands.

With the Defence R&D Organisation (DRDO) awaiting a long-cleared order for 118 Arjun MBTs, the ministry of defence (MoD) instead asked the Ordnance Factory Board (OFB) last November to build 464 Russian-origin T-90S tanks at the Heavy Vehicles Factory, Avadi (HVF). With each T-90 costing about Rs 28 crore, the order is worth an estimated Rs 13,000 crore.

The army continues to block the indigenous Arjun tank even though, in a comparative trial the army conducted in the Rajasthan desert in March 2010, the Arjun proved itself equal to, or better than, the Russian T-90.

In the trial, one squadron (14 tanks) of Arjuns was pitted against an equal number of T-90s. Top army generals who witnessed the trial admitted the Arjun performed superbly. Whether driving cross-country over rugged sand dunes; or accurately hitting targets with its powerful main gun; the Arjun established it was a tank to reckon with.

Yet, the army refused to order more Arjun tanks, beyond the 124 it had already inducted into service. Army insiders say there is an ingrained belief that Russian tanks are better than Indian ones. However, it was officially stated that the 62.5-tonne Arjun was too heavy for roads and bridges along the Pakistan border, and too wide to be transported by train.

Under pressure from the MoD to order another 118 Arjuns, the army then demanded several capability enhancements in the tank to make it more effective. At a meeting of the MoD-led Arjun Steering Committee in 2010, the army demanded an improved version of the tank, which would be called the Arjun Mark 2.

The Arjun Mark 2 was required to have 83 capability enhancements, including 15 major and 68 minor changes. Incredibly, given the army’s complaint that the tank was too heavy, the new enhancements would make the tank heavier by another 6 tonnes.

These included the fitment on the tank of mine ploughs (1.6 tonnes extra), explosive reactive armour (1.5 tonnes), suspension improvements (one tonne) and another two tonnes in other areas. Having complained earlier that a 62.5 tonne Arjun tank was too heavy, the army signed off on a six-tonne weight increase to 68.5 tonnes.

In August 2011, the MoD announced it had “cleared the proposal for placement of indent for 124 MBT Arjun Mark 2”. It said each enhanced Arjun would cost Rs 37 crore and the first batch would roll out by 2015.

By June 2012, the DRDO offered the Arjun for trials with all the enhancements, except one: a cannon-launched guided missile (CLGM) the army wanted to fire through the Arjun’s main gun. The DRDO had sourced the Lahat CLGM from Israel, but that could strike targets between 2-5 kilometres (km) away. The army insisted on being able to strike targets as close as 1.2 km.

The DRDO pointed out that the Arjun's powerful main gun had already proved its ability to destroy targets at ranges out to 2 km. But the army insisted the CLGM should be usable against targets 1.2 km away. So the DRDO began work on an indigenous CLGM to meet those specifications.

By 2015, a series of trials had validated the improvements the army demanded. Even the CLGM's laser designator was tested and validated with Lahat missiles. The DRDO asked for production order, promising to develop and supply the missile on priority.

However, the army dilly-dallied for three years, until March 2018, when it was agreed that the next batch of Arjuns would be supplied without missile firing capability, which would follow up separately. This version would be designated Arjun Mark 1A.

After several months of delay, Arjun Mark 1A trials were held in December 2018 and the tank found fit in all respects. The army's trial team recommended the Arjun Mark 1A be inducted into service.

Incredibly, more than a year later, the army has not yet placed an indent for 118 Arjun Mark 1A. It has raised numerous issues – including ammunition availability, non-availability of spares and low indigenous content – to successfully avoid placing an order.

Were an indent to be placed today, it would still take HVF about 36 months to start delivering completed Arjun tanks. The DRDO is confident it would develop the CLGM by then, so those 118 tanks will actually be Arjun Mark 2, with full CLGM capability.

Asked whether there was frustration over the lack of orders, DRDO chairman, Satheesh Reddy told Business Standard: "No, we cannot get frustrated. We are very positive. The user trials for the Mark 1A have been completed in December 2018 and we have even developed the ammunition now. I am sure that the Indian Army will soon be inducting the Arjun Mark 1A."

Business Standard

Sat, 08 Feb 2020

Poor planning in buying radio sets could hurt forces

By Ajai Shukla

New Delhi: Owing to the absence of tri-service coordination in buying radio equipment, the army, navy and Indian Air Force (IAF) could find themselves cut off from each other in future operations, simply because they are unable to communicate and share data.

In planning and procuring their next generation of tactical radio sets, all three services are moving in completely different directions, which could result in their being isolated in battle and unable to coordinate operations.

The IAF is equipping its aircraft and ground stations with cutting edge "software defined radio" (SDR), which will be integrated onto its platforms by Israeli firm, Rafael (not to be confused with the French Rafale fighter). The radio sets themselves will be manufactured in India in a joint venture (JV) between Rafael and Indian firm, Astra Microwave, called Astra Rafael Comsys (ARC).

In contrast, the navy has chosen to source its future radio equipment from Bharat Electronics Ltd (BEL), which has developed its own SDR sets. Warships have the luxury of ample space to install their SDR sets, unlike fighter aircraft in which space is critical. Therefore, the navy is not concerned about the size and weight of BEL's SDR equipment, which is too bulky for aircraft.

Meanwhile, the army is following a third line by inviting India's defence industry to compete in developing SDR equipment under the Make-2 procurement category. Under Make-2, companies develop equipment at their own cost and offer it to the MoD, which chooses what it likes.

Unless there is intervention by the newly appointed Chief of Defence Staff (CDS), whose mandate includes coordinating equipment procurement between the three services, the military's interoperability could be seriously undermined.

To this day, the army's armoured regiments encounter serious interoperability problems, simply because some units were equipped with Israeli TADIRAN radio sets, while others operated STARS V2 radio sets built and supplied by BEL.

With these two sets operating on different encryption algorithms, and therefore unable to communicate with each other in secrecy mode, armoured forces are forced to communicate in clear, allowing the enemy to easily intercept and monitor our radio communications.

Starting from 2004, the army bought some 20,000 TADIRAN radio sets. Despite the problems of interoperability with BEL's equipment, another purchase is being made of over 5,000 more.

In switching to next-generation communications, the IAF has taken the lead. Starting from 2012, it identified SDR as the technology of the future and initiated the purchase of 450-500 radio sets. These are to be fitted across its entire aircraft fleet, as well as ground stations, ensuring secure communications across the entire operational spectrum.

In 2017, a contract worth over \$100 million was signed with Israeli firm, Rafael, for almost 500 SDR sets. In 2018, Rafael and the IAF began the complex process of integrating the SDR sets into all the different fighters, transport aircraft and helicopters in the fleet.

Once that is completed, ARC – the Rafael-Astra JV – will begin manufacturing the SDR sets in India. Contacted for details, Eli Hefets of Rafael stated that Rafale has placed an SDR order worth about \$30 million on ARC, and that the radio sets the JV would supply the IAF would have an indigenization component of over 80 per cent.

Hefets stated that, while this production would bring in offsets credits for Rafael, it would continue production even after the Indian military's requirements were satisfied. "We cannot have a short-term approach towards setting up production of such sophisticated equipment in India. We have trained the workers, bought machinery, qualified the product and sourced sub-systems and components from over 100 small Indian companies. This is for the long term," said Hefets.

It is learnt that ARC would also be participating in the army's tender for SDR. However, there is no certainty it would win, which would leave all three services with different – and probably incompatible – radio equipment.

The army order is potentially massive, due to its size. The tri-service Long Term Integrated Perspective Plan (LTIPP), which spells out the three services' equipment requirements out to 2027, states that the army could require about 60,000 radio devices – which include vehicle-mounted, man-portable as well as handheld sets. However, a back-of-the-envelope calculation reveals that the real requirement could be twice that number.

The army has already issued a Request for Information (RFI), which envisages a futuristic IP-based, flexible, redundant communications network, based on SDR.

Spin test in July may revive intermediate jet trainer plan

HAL Chairman R Madhavan has told ET that a spin recovery parachute is being integrated onboard the test aircraft this month, following which it would be put through a series of tests to prove that it meets service requirements. The air force is in dire need of an IJT as 'Kiran Mk II' fleet is being phased out, putting a strain on its pilot training programme

By Manu Pubby

New Delhi: The indigenous programme to develop an intermediate jet trainer (IJT) could get back on track with a crucial 'spin recovery' test in July, with developer Hindustan Aeronautics Limited (HAL) confident that modifications carried out on the test aircraft would prove successful.

HAL Chairman R Madhavan has told ET that a spin recovery parachute is being integrated onboard the test aircraft this month, following which it would be put through a series of tests to prove that it meets service requirements.

The air force is in dire need of an IJT as 'Kiran Mk II' fleet is being phased out, putting a strain on its pilot training programme. The IJT 'Sitara' project has been in the works since 1999 but had hit a roadblock in 2014 after it failed the safety tests.

After facing difficulties in the Spin Test —in which the plane is stalled midair and recovered as part of the training process — a foreign consultant was hired by HAL and structural changes have been carried out. "We are getting the recovery parachute this month and once we integrate it, we can restart the testing along with all the modifications that BAR (Bihrl Applied Research) has given. We will start the first spin tests by July and once that happens, we will be back in the game," Madhavan said.

The indigenous aircraft has gone through a significant modification, including an increase in the length of the rear fuselage and a redesigned rudder placement. A timeline for final development would be available only after the spin tests are completed.

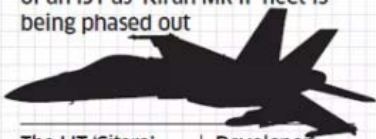
"We have seen the mathematical models and in this case we are quite confident that the modifications will work and we can meet the required tests," the HAL chairman said. The spin recovery parachute being integrated is a fail safe mechanism.

HAL is also working on changes in the Russian origin engine of the IJT. "The modifications have been done and we expect the life to be increased from just about 100 hours right now," Madhavan said.

If the IJT clears tests, the deliveries can be carried out at an accelerated pace, given HAL already has 16 serial production aircraft ready that can be quickly modified. The air force has a requirement of 83 IJTs and the number could cross a hundred if the needs of the Navy are also factored in.

<https://economictimes.indiatimes.com/news/defence/spin-test-in-july-may-revive-intermediate-jet-trainer-plan/articleshow/74049942.cms>

The Need for IJTs
The air force is in dire need
of an IJT as 'Kiran Mk II' fleet is
being phased out



<p>The IJT 'Sitara' project has been in the works since 1999 but had hit a roadblock in 2014 after it failed the safety tests</p>	<p>Developer HAL getting the recovery parachute this month and plans testing along with all the modifications by July</p>
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83
IJTs needed by IAF. The number could cross a hundred if needs of the Navy are also factored in

डिफेंस एक्सपो भारत के आने वाले समय का शंखनाद :

रक्षामंत्री राजनाथ सिंह

सेनाओं के शौर्य व रक्षा उपकरणों की अंतरराष्ट्रीय प्रदर्शनी Defense Expo 2020 का समापन।

रक्षामंत्री ने कहा रक्षा उत्पादन का सशक्त केंद्र बनेगा भारत। लखनऊ को मिली वैश्विक पहचान।

लखनऊ: भारतीय सेनाओं के शौर्य को जल, थल और नभ में प्रदर्शित करने का अंतरराष्ट्रीय मंच देने वाला डिफेंस एक्सपो 2020 अपनी स्वर्णिम यादें छोड़कर शनिवार को विदा हो गया। रक्षा के क्षेत्र में भारत के सामर्थ्य और दुनिया भर में फैले डिफेंस उपकरणों के बाजार को शोकेस करने वाले इस आयोजन की सफलता का अंदाज इस बात से लगाया जा सकता है कि 12 लाख लोगों ने इसके दीदार किए। एक्सपो के समापन समारोह में रक्षा मंत्री राजनाथ सिंह ने कहा कि बीते चार दिनों में देश और दुनिया ने एक नया भारत देखा है। यह रक्षा क्षेत्र में समृद्ध, सशक्त और समर्थ भारत है। डिफेंस एक्सपो का यह ग्यारहवां संस्करण शंखनाद था कि आने वाले समय का भारत कैसा होगा। साथ ही यह संकेत दे गया कि भविष्य में हमारा देश डिफेंस मैनुफैक्चरिंग का सशक्त केंद्र बनेगा।

राजनाथ सिंह ने कहा कि देश के अब तक के सबसे बड़े डिफेंस एक्सपो की अभूतपूर्व सफलता से मैं गौरवान्वित महसूस कर रहा हूँ। यह एक्सपो सिर्फ उप्र नहीं बल्कि रक्षा क्षेत्र के प्रति देश की आशा, आकांक्षाओं का प्रतीक है। यह प्रदर्शनी भारत के डिफेंस मैनुफैक्चरिंग सेक्टर के लिए मील का पत्थर है। यह देश को रक्षा उत्पादन के क्षेत्र में आत्मनिर्भर बनाने के साथ रक्षा उपकरणों का निर्यातक भी बनाएगा। आयोजन की उपलब्धियों का उल्लेख करते हुए उन्होंने डिफेंस एक्सपो के बैनर तले पहली बार आयोजित इंडिया-अफ्रीका डिफेंस मिनिस्टर्स कॉन्क्लेव का भी जिक्र किया।

लखनऊ घोषणापत्र का जिक्र

इंडिया-अफ्रीका डिफेंस मिनिस्टर्स कॉन्क्लेव में अंगीकार किए गए लखनऊ घोषणापत्र का जिक्र करते हुए उन्होंने कहा कि भारत और अफ्रीकी देश रक्षा उत्पादन के साथ समुद्री सुरक्षा के क्षेत्र में सहयोग देने, आतंकवाद के खतरों से निपटने के लिए इंटेलेजेंस व निगरानी साझा करने के लिए सहमत हुए हैं। आयोजन में डेढ़ सौ से ज्यादा विदेशी कंपनियों, तीन हजार से ज्यादा विदेशी प्रतिनिधियों और रक्षा विशेषज्ञों की आमद ने इसे अंतरराष्ट्रीय शोहरत दिलाई है। डिफेंस एक्सपो दुनिया के सामने आने वाली सामरिक चुनौतियों और खतरों से निपटने का साझा मंच हो गया है।

जांबाजों के हौसले को किया सलाम

अदम्य साहस और अप्रतिम शौर्य का प्रदर्शन करने वाले तीनों सेनाओं के जांबाज सैनिकों के हौसलों को सलाम करते हुए रक्षा मंत्री ने कहा कि एक्सपो ने देश की जनता को सेनाओं की शक्ति और पराक्रम का अहसास कराया है। सूरज और चंद्रमा भी हमारे सैनिकों के शौर्य के साक्षी बने।

उप्र और लखनऊ की तारीफ

डिफेंस एक्सपो के सफलतम आयोजन के लिए उन्होंने मुख्यमंत्री योगी आदित्यनाथ और उनकी टीम को साधुवाद दिया। यह भी कहा कि इस आयोजन ने साबित कर दिया है कि उप्र अद्भुत क्षमता और अपार संभावनाओं का प्रदेश है। डिफेंस एक्सपो ने लखनऊ को वैश्विक पहचान दिलाई है।

<https://www.jagran.com/uttar-pradesh/lucknow-city-defense-minister-rajnath-singh-arrives-at-the-closing-ceremony-of-defense-expo2020-20012819.html>

THE TIMES OF INDIA

Sat, 08 Feb 2020

\$5 bn defence export target to be achieved by 2024: Rajnath Singh

Lucknow: Defence minister Rajnath Singh on Friday expressed confidence that the country will achieve the target of five billion dollar worth of defence exports by 2024.

"Today MoUs signed by us will strengthen defence industrial base and will prove beneficial for the country. You all must be convinced that our policy in defence sector has started giving results," he said at an event - Badhan - at the Defexpo.

"In 2018-19, defence export was Rs 10,745 crore, which was seven times the export in 2016-17. Seeing the success of this Defence expo, I am sure that by 2024, we will achieve the target of five billion dollar worth of defence exports," the minister said.

He said till now over 200 agreements have been concluded in this Defexpo and described it as "historic". Chief minister Yogi Adityanath said through the Uttar Pradesh Expressways Industrial Development Authority (UPIEDA), 23 MoUs were signed and Rs 50,000 crore investment is expected. Besides, it is likely to generate 2.50-3 lakh jobs, he said. "Uttar Pradesh has emerged as a favourite investment destination," he said.

Defence secretary Ajay Kumar said during this Defexpo, initially a target of signing 100 MoUs and business agreements was fixed, but till now over 200 MoUs have been signed which is the beginning of a new chapter in this sector. Defence manufacturing firms from across the world are participating in the five-day mega event, which was inaugurated by Prime Minister Narendra Modi on Wednesday.

<https://timesofindia.indiatimes.com/india/5-bn-defence-export-target-to-be-achieved-by-2024-rajnath-singh/articleshow/74006629.cms>

'2024 तक भारत का रक्षा निर्यात लक्ष्य पांच अरब डॉलर का'

जनसत्ता ब्यूरो
नई दिल्ली, 7 फरवरी।

रक्षामंत्री राजनाथ सिंह ने शुक्रवार को कहा कि रक्षा क्षेत्र में सरकार की नीतियां अब परिणाम देने लगी हैं और पूरा भरोसा है कि भारत वर्ष 2024 तक रक्षा निर्यात को पांच अरब डॉलर तक पहुंचाने के लक्ष्य को हासिल कर लेगा। रक्षामंत्री ने लखनऊ में आयोजित डिफेंस एक्सपो के तीसरे दिन विभिन्न निजी तथा सार्वजनिक संस्थाओं द्वारा रक्षा क्षेत्र से सम्बन्धित सहमति पत्रों (एमओयू) पर हस्ताक्षर के लिए आयोजित 'बंधन' कार्यक्रम में कहा 'एमओयू हमारे रक्षा औद्योगिक आधार को और मजबूत करेंगे। रक्षा क्षेत्र में हमारी नीतियां अब परिणाम देने लगी हैं।'

उन्होंने कहा 'हमारी सरकार ने इस दिशा में कई बार नीतियों में सुधार किए। हमने लाइसेंस प्रक्रिया को काफी हद तक सरल किया है और एफडीआई कैप को भी बढ़ाया है। रक्षा निर्यात को बढ़ावा देने के कदम उठाए। हमने डिफेंस ऑफसेट नीति को भी व्यवस्थित किया है।



कहा रक्षा क्षेत्र में सरकार की नीतियों के नतीजे सामने आने लगे

का है। उन्होंने कहा, 'भारत का रक्षा निर्यात वर्ष 2018-19 में 10745 करोड़ रुपए तक पहुंच गया, जो 2016-17 में हुए निर्यात के सात गुने से भी ज्यादा है। वर्ष 2024 तक पांच अरब डॉलर के रक्षा निर्यात के लक्ष्य को हम जरूर हासिल कर लेंगे।' रक्षा मंत्री ने कहा कि आज इस समारोह में 71 एमओयू किए गए, 13 उत्पाद लांच हुए, छह प्रमुख घोषणाएं हुईं और 18 नए तकनीक अंतरण समझौतों पर दस्तखत

भविष्य में इसे और बेहतर बनाया जाएगा।' उन्होंने कहा कि 2018-19 में रक्षा क्षेत्र की कंपनियों का उत्पादन 80 हजार करोड़ रुपए के रेकॉर्ड स्तर पर पहुंच गया है। इसमें निजी क्षेत्र का योगदान 60 हजार करोड़ रुपए

हुए हैं। यानी 100 से ज्यादा करार हुए हैं। इस एक्सपो के दौरान अभी तक 200 से ज्यादा समझौते हुए हैं। यह ऐतिहासिक उपलब्धि है। यहां तकनीक हस्तांतरण के जो 18 समझौते हुए हैं। इस मौके पर उत्तर प्रदेश के मुख्यमंत्री योगी आदित्यनाथ ने कहा कि यहां 50 हजार करोड़ रुपए के निवेश के दस्तावेजों पर हस्ताक्षर हुए हैं। इससे ढाई से तीन लाख नौजवानों को रोजगार मिलेगा। मुख्यमंत्री ने कहा, 'पिछले ढाई वर्ष के दौरान हमारी सरकार प्रदेश के अंदर ढाई लाख करोड़ रुपए से ऊपर का निवेश कराने में सफल हुई है। इसके माध्यम से 33 लाख से अधिक लोगों को सीधे-सीधे नौकरी और रोजगार से जोड़ने में हमें मदद मिली है।'

डीआरडीओ चेरमैन जी. सतीश रेड्डी ने इस मौके पर कहा, 'आज हम तकनीक अंतरण के 17 करार कर रहे हैं। हम नॉलेज पार्टनर के तौर पर डिफेंस कॉरीडोर के लिए एमओयू कर रहे हैं। एक बार कॉरीडोर बनने के बाद हम एक अनुसंधान एवं विकास केन्द्र बनाएंगे ताकि कॉरीडोर से जुड़े उद्योगों की मदद हो सके।'

NEWS 18

Mon, 10 Feb 2020

IAF has to reorient, retrain itself to changed paradigm of war, former Chief BS Dhanoa

Former IAF chief BS Dhanoa underlined the needs for a "full-spectrum capability", as the enemy keeps modernising, and to address some of the "capability voids"

Ahmedabad: The Indian Air Force (IAF) needs to "reorient and retrain" itself to a changed paradigm of war, former Air Chief Marshal BS Dhanoa said here on Sunday.

He also said the Rafale fighter aircraft and S400 missile defence system will help restore technological asymmetry in India's favour.

"Though the Indian Air Force has trained itself to fight a full-scale conventional war in a joint campaign with sister services, it has to reorient and retrain itself to the changed paradigm. It must plan and address capability voids in due course of time," the former Air Chief Marshal said.

He was speaking on the topic 'IAF In The Changed Security Paradigm' at the fifth Flying Officer Nirmal Jeet Singh Sekhon PVC annual memorial lecture organised here by the Gujarat chapter of the Air Force Association.

Speaking on likely scenarios of the future, the IAF chief (ret'd) Dhanoa said, "We come to realise that sub-conventional conflict over terrorist attack on one of our installations and personnel has the highest probability of occurrence, because it can happen anytime and anywhere. This is something for which we need to be prepared 24/7."

"A skirmish or a localised conflict like Kargil due to a terrorist attack that has gone awry like Uri and Pulwama is within the realm of possibility of our western neighbour," he said.

The former IAF chief added that there was a need to "re-prioritise our expenditure based on this changed paradigm".

"Hence, spending on the integrated perimeter security system of our bases is more important than bemoaning not having a full authorised centre required for a two-front war," he said.

The former IAF chief also said, "With the induction of Rafale and S-400, the technological asymmetry will once again be restored in our favour. Even if there is going to be a paradigm shift in the way they are going to fight the next war, there is a need to have a technological superiority so that our deterrence remains effective and we can maintain the peace".

He underlined the needs for a "full-spectrum capability", as the enemy keeps modernising, and to address some of the "capability voids".

Stressing that cyber and space were two new domains which have to be defended strongly, the former ACM said, "The way we have a network enabled force, there are so many systems riding on our communication network, and very shortly deployment of operational data link, we will become a network force."

"Cyber will have to be defended very strongly. Second is space, initially used only for telecommunication...add a new dimension which has changed the paradigm," he added.

The former IAF chief said the surgical strike carried out in retaliation to the attack on the Uri base has signalled a paradigm shift in the way Indian government would respond to terrorist attacks involving mass casualties.

"A surgical strike was authorised, and Balakot strike was approved by the government to send a political message to Pakistan that such attacks will incur a heavy price.

"Pakistan government got the message that the new government will respond militarily to major terrorist attacks on its soil... This happened because of decisive national leadership in place, backed by the fact that should it escalate, we are ready for it at short notice. After all, it was a joint battle, and government cannot battle without all the three services being ready," he said.

Regarding the Balakot strike, the former IAF chief said going after a "non-military target" was "a very wise decision".

"The operational capability and our intelligence capability cannot be compromised to just try and win the perception battle in the media. But both the Pakistani establishment and (terror group) Jaish-e-Mohammed got the message," he said.

The former IAF chief further said that there were no major terror attacks between February and June, 2019 till the conclusion of the Lok Sabha polls because the Army, Navy and Air Force were "forward deployed to give a punitive response at a very short notice."

He added that the attack on a terror camp in Pakistan was meant to give a message to that country's establishment, and "not to the Pakistani public, or an effort to win a propaganda battle with the Pakistani and international media".

"Had it been so, we would have used different weapons and different modes of attacks for which presently Pakistan has no counter," he added.

Lt General PM Hariz (retd) and Vice Admiral Vijay Shankar (retd) also delivered speeches on the occasion.

<https://www.news18.com/news/india/iaf-has-to-reorient-retrain-itself-to-changed-paradigm-of-war-former-chief-bs-dhanoa-2493669.html>



Sat, 08 Feb 2020

Time to upgrade military capabilities running out

To meet the urgent need for financial resources so as to upgrade the nation's military capabilities, most of the ordnance factories and DRDO establishments should be put under the hammer.

Equally, the civilian staff paid out of the defence budget should be substantially reduced. Gains from such sales should be used for making up for the deficiencies of weapons and equipment. No upgrade of artillery has taken place for three decades

By Lt Gen Harwant Singh (Retd)

DEFENCE allocation in the current Budget is Rs 3,37,553 crore as compared to Rs 3,18,931 crore allocated in the interim Budget 2019-20 — an increase of a mere two per cent. Taking into account the increase in the DA of those paid out of the defence budget, inflation in the cost of weapons and equipment and fall in the value of rupee — 70 per cent of the defence equipment is imported — this so-called increase is, in fact, a regression in the allocation for defence. Equally, the defence budget, in terms of percentage of the GDP, has slightly come down from the previous year's allocation.

It can be argued that with the current state of economy, and equally, if not more pressing, other demands on the national Budget, it was not possible to increase the allocation for defence, no matter how pressing the need for more funds may be.

There has been much discussion on this low allocation within the defence fraternity and more is likely to appear in the media, though not much discussion on the subject is expected in Parliament. Nor do the Members of Parliament appear to be fully alive to the security scene and the state of the armed forces of the country. For the latter, the higher command of the defence forces is to be partly blamed, when they assure the government and the nation that the Army can wage a war on two and a half fronts and the Indian Air Force's claim of its ability to fight a war on two fronts. The claim that India can take back PoK and another that Pakistan can be defeated in six to eight days add to this false assurance.

Of the current allocation for defence, Rs 1,34,989 crore will be for pay and allowance (which include approximately 3.5 crore civilians), Rs 1,33,819 crore for pensions and the remaining Rs 1,13,626 crore for capital expenditure. The civilian staff, due to their higher age of retirement, consequently higher pension and grant of non-functional financial upgrade (NFFU), in relative terms, get a greater share from the allocation for pay and allowances. Some years earlier, pensions did not form a part of the defence budget.

Before looking at the state of the armed forces, we may review the security scene. China does not appear willing to settle the border dispute with India, it continues to claim Arunachal Pradesh and is in occupation of parts of Ladakh. It has objected to Ladakh being declared a union territory. It is also keeping the border alive by periodically breaching the LAC. Its military capabilities are many times more than that of India. It is in the process of building the China-Pakistan Economic Corridor (CPEC). It has also been busy setting up a 'string of pearls', which in effect is an attempt to strangulate India. China has gained considerable influence in Nepal, Bangladesh, Myanmar, Sri Lanka, and has the Maldives under debt of \$3 billion. It is also planning to build the China-Myanmar Economic Corridor.

China has been using Pakistan as a proxy to tie down India locally. China has upped its military infrastructure in Tibet, set up naval bases in Myanmar, Sri Lanka, Bangladesh, Djibouti and Aden and is planning a large military base near Gwadar (Pakistan). China has been upgrading Pakistan's military capabilities. All these moves relate to capturing markets and economic dominance: akin to the gun-boat diplomacy of 16th and 17th centuries, but in a different format.

China has made great progress in cyber warfare, advance weapon technologies, developed the fastest super computer (Sunway TaihuLight) and the J-31 fifth generation stealth fighter. It has developed an electromagnetic catapult gun for its new aircraft carriers and made great strides in robotics, artificial intelligence and drones.

At the other end, Pakistan keeps pushing terrorists across the LoC in J&K and even across the international border (IB). Equally, it is keeping alive these borders through artillery shelling and use of small arms. All these developments do not augur well for India.

Therefore, for India, the security scene is rather grim. The country imports nearly 70 per cent of defence equipment. The deficiencies in military's wherewithal are indeed appalling. The IAF is not only short of the number of squadrons, but a large fleet of fighter aircraft is also overdue for replacement. The Indian Navy is low on its naval fleet, especially taking into account the Chinese Navy's forays into the Indian Ocean. The Indian Army is looking for a suitable rifle for its infantry.

Yet, the defence forces' higher command has been loosely talking of fighting a two-front war. The demands and complexity of a two-front war are not easy to comprehend. A two-front war had been the bane of German General Staff for half a century across the two World Wars. Such claims give the nation a false sense of security, which in turn leads to no urgency on its part to upgrade the military.

There have been comments on the size of the Army and its budget, calling for reduction in both. The size of a nation's defence budget is related to a wide range of factors. With the GDP as the base, the percentage of it that need to be allotted to defence depends on a number of issues. The size of the defence forces itself being one factor, which in turn is related to the geo-strategic environment, extent and nature of threats to security and the time frame in which these can materialise. Then, there is the issue of the type and extent of borders and the imperatives of safeguarding the territorial integrity of the country. It also depends on the armed forces' ammunition stocks, equipment and weaponry and the need for their modernisation.

It is these deficiencies that need to set the nation worrying. There is little night-fighting capability, no upgrade of artillery has taken place for three decades and the infantry is without suitable small arms or proper boots for the staff. Air defence capability is low. Deficiencies in reserves of ammunition and other war-like stores appear alarming.

Given the limitations of financial resources, there is a need to examine the areas from where resources can be created. One is to cut down on the civilian component, paid out of defence budget. The other is the sale of most of the ordnance factories and obtaining of stores produced by these from the open market at competitive prices. At present, these ordnance factories have a monopoly and as a single vendor, they dictate the prices of items supplied to the military.

There are over four dozen DRDO (Defence Research and Development Organisation) establishments whose performance has so far been dismal. Repeated demands to evaluate their performance through a science audit have met with little success. Thus, many of these have nothing worthwhile to show while some are still struggling to invent the wheel. The defence forces continue to import as much as 70 per cent of their defence equipment. The drive to 'Make in India' has bypassed the DRDO.

Therefore, to meet the urgent need for financial resources so as to upgrade the nation's military capabilities, most of the ordnance factories and DRDO establishments should be put under the hammer. Equally, the civilian staff paid out of the defence budget, should be substantially reduced.

Gains from such sales should be deployed to meet the urgent need for making up for deficiencies of weapons and equipment, and upgrading the military's capabilities.

Maybe, the time to upgrade military capabilities is running out. It may be appropriate to end this piece by recalling the famous saying that policies can change in a matter of weeks and months while military capabilities take years to come about.

<https://www.tribuneindia.com/news/time-to-upgrade-military-capabilities-running-out-37501>

THE ECONOMIC TIMES
WWW.ECONOMICTIMES.COM

Sat, 08 Feb 2020

CDS makes renewed push for Defence University

The matter is also set to be raised with the chiefs of the defence services and the defence minister. The Indian Defence University (IDU), a plan mooted first 53 years ago and had its foundation stone laid in 2013, has been envisioned for addressing deficiencies in India's security management and formulate policies on strategic challenges

By Shaurya Karanbir Gurung

New Delhi: Establishment of an Indian Defence University, which has faced several delays and cost revisions, is now getting a renewed push from the chief of defence staff (CDS), General Bipin Rawat.

Officials have taken a two-pronged approach — through the CDS and the bureaucracy — to ensure faster clearance of the draft Indian Defence University (IDU) Bill from the Prime Minister's Office. The matter is also set to be raised with the chiefs of the defence services and the defence minister.

The Indian Defence University (IDU), a plan mooted first 53 years ago and had its foundation stone laid in 2013, has been envisioned for addressing deficiencies in India's security management and formulate policies on strategic challenges. The draft IDU Bill has been lying at the PMO for the past one and a half years, officials said.

Establishment of the university is among the priorities of the CDS. One of the first presentations made before General Rawat after he took over as the CDS was on the IDU, officials said.

“The CDS has been monitoring its progress. There is a concerted effort by him to push for establishing the IDU. He had mentioned then that the three chiefs of the army, air force and navy should also be briefed about the matter,” an official said.

A date is being finalised to give them this briefing, and defence minister Rajnath Singh is also being made aware of the details of the IDU. Officials added that the IDU Bill could be presented in the next session of Parliament. This is one approach being adopted by the headquarters of the Integrated Defence Staff (IDS). It has also created a project formulation team for establishing the university.

The other approach is through the bureaucracy. The IDU has been proposed to come under the Department of Defence, which is headed by the defence secretary.

On being asked why won't the university come under the CDS-headed Department of Military Affairs (DMA), officials said that the university would deal with higher defence studies involving bureaucrats and foreign delegations, while the DMA's function is to largely look at military affairs.

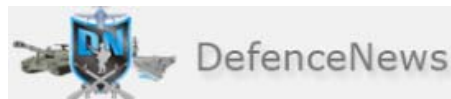
The university is proposed to have departments on national security, defence technology and defence management. Tri-services institutions that are proposed to be affiliated to it are the National Defence College, the College of Defence Management, National Defence Academy and the Defence Services Staff College.

The Comptroller and Auditor General (CAG) in a report tabled in the Lok Sabha this week had said, “The establishment of the IDU recommended (by the Kargil Review Committee) in 1999 to address the deficiencies in India's security management systems did not fructify even after lapse of

two decades in the absence of revised Cabinet approval for IDU. This has deprived the nation of an educational institution excelling in the area of defence and national security.”

It added that the project cost had increased from Rs 395 crore in May 2010 to Rs 4,007.22 crore in December 2017. The national auditor said the draft IDU legislation was lying with the Cabinet Secretariat since December 2017 for approval (as of August 2019). The defence ministry last August informed the CAG that the draft IDU Bill prepared after inter-ministerial consultations was yet to be approved by the Cabinet and the detailed project report for the proposed IDU could be finalised only after the law is enacted. The ministry explained that the passage of the proposed law was essential for establishing the IDU, which would be an autonomous institution.

<https://economictimes.indiatimes.com/news/defence/cds-makes-renewed-push-for-defence-university/articleshow/74020894.cms>



Sat, 08 Feb 2020

Indian firm comes up with 180 km strike range missile

Airbus SE and US-based Lockheed Martin Corp and Boeing Co. are eying multi-billion dollar deals as India looks to upgrade ageing aircrafts

In a major boost for Make in India, an Indian firm JSR Dynamics came up with its indigenous 180 km strike range air to ground missile Khagantak at the ongoing Defexpo-2020 here.

Speaking to ANI, JSR Dynamics Managing Director Air Marshal SB Deo said, "The Khagantak missile is a guide weapon with excellent aerodynamic performance and a seeker in the front which has got artificial intelligence to recognise targets."

"The missile is an air-launch weapon with a range of 180 km when released from a height of 12 km," he added.

On the need to have more indigenous companies working for the Indian defence sector, Deo said that previously India had to spend enormous money on foreign firms to get equipment at an unreasonable cost.

"Earlier, we didn't have any choice but to buy equipment from foreign companies as it is a necessity for our defence sector. The government realised that with Indian companies making the equipment we can have it whenever we need it," he added.

Deo also said that there is a huge market for precision weapons and some of the countries offering these weapons are at times driven by political compulsion.

"These countries sell their weapons cheap but they are not of the required quality. On the other hand, India has cheap labour but smart. In India software comes naturally to us. It is only in engineering that we were behind but we have access to the best machines. We can amalgamate these resources and make sure that we are in possession to compete globally. Hence, we will the quality of equipment like Europe but our pricing will be according to the Asia market," he further said. JSR Dynamics Managing Director expressed his happiness in having Indian companies producing jet engines.

He said, "If Indian-made jet engines are available then we will use those engines into our missiles. These missiles have a range of up to 297km, one carries a warhead of 72 kg and the other carries a warhead of 146 kg." The 'DefExpo 2020' will culminate on February 8.

<https://www.defencenews.in/article/Indian-firm-comes-up-with-180-km-strike-range-missile-809210>

World's 'cheapest gunshot locator' developed by Indian Army's CME could prove deadly for terrorists

The gunshot locator, touted to be the cheapest in the world, can locate the source of the bullet fired from up to 400 metres

By Pranav Kulkarni

New Delhi: In what could spell death for terrorists carrying out hidden attacks against the Indian security forces, the College of Military Engineering (CME), along with a private firm, has developed the world's 'cheapest gunshot locator'. The device, the developers claim, can identify the location of a bullet from a distance of 400 metres. The technology could help neutralise terrorists faster, especially in areas such as Jammu and Kashmir, where the security forces have been fighting a proxy war.

In yet another significant development, an Army Major has also developed a helmet which can stop an AK-47 bullet round from a distance of 10 meters. "It weighs only 1.4 kgs," the firm involved in its development claimed.

The products are on display at the ongoing annual event DefExpo in Lucknow. "The ballistic helmet has been developed under project Abhedya by Major Anoop Mishra who has also developed a full-body protection bulletproof jacket which can withstand even sniper rifles," Army officials said during the annual event in Lucknow.

The development of both the products is crucial for the Army, especially for use during the counter-insurgency (CI), counter-terrorism (CT) operations in the Kashmir Valley. It may be noted that the importance of bullet-proof jackets (BPs) and ballistic helmets were highlighted by the Ministry of Defence in 2018.

"During 2016-17, 50,000 bulletproof jackets had been procured for Indian Army through Revenue route. The Contract for procurement of 1,86,138 BPs through Capital route, under Buy (Indian) category, has been concluded in April 2018. Further, a contract for procurement of 1,58,279 Ballistic Helmet through Capital route had been concluded in December 2016," the then minister of state for defence Subhash Bhamre had said in Lok Sabha.

Why the development of these equipment matters

CME, which trains sappers, meaning engineers for the Indian Army, is a premier technical training institute based out of Pune. It trains personnel of Corps of Engineers on combat engineering, works services besides others.

The development of the helmet and the gunshot locator comes at a time when the centre has claimed that abrogation of Article 370 will end terrorism in Jammu and Kashmir. Days after revoking Article 370, Union Home Minister Amit Shah had said that 'removal of special status to Jammu and Kashmir under Article 370 of the Constitution will end terrorism and lead to progress of the region'. The development and production of the equipment could help the Army combat the dreaded terror elements in the Valley while reducing the casualties of the forces.

<https://www.timesnownews.com/india/article/worlds-cheapest-gunshot-locator-developed-by-indian-armys-cme-could-prove-deadly-for-terrorists/550848>

Airbus SE, Boeing Co eye multi billion dollar deals with India

Airbus SE and US-based Lockheed Martin Corp and Boeing Co. are eyeing multi-billion dollar deals as India looks to upgrade ageing aircrafts

Lucknow: US and European defence firms backed Indian Prime Minister Narendra Modi's military modernisation drive at a defence exhibition on Friday, despite a lengthy procurement process running into years and limited funds.

Airbus SE and US-based Lockheed Martin Corp and Boeing Co. are eyeing multi-billion dollar deals under Modi's aim to upgrade an ageing fleet of aircraft and enhance local arms manufacturing to cut imports.

"I feel encouraged overall," Anand Stanley, President and managing director of Airbus India and South Asia, told Reuters.

"Every year the government is doing capital allocation. They are spending," he said.

The military is also looking to buy submarines, warships and battlefield communication systems. But these have made little headway.

Airbus is offering to set up an assembly line in India in partnership with the Tata Group to produce the C295W military transport aircraft as a replacement for Indian Air Force's Avro fleet.

The 120 billion rupee Avro replacement programme has been in the pipeline for almost a decade.

Airbus on Thursday signed a memorandum of understanding (MoU) with India's Adani Aerospace and Defence, part of the diversified Adani Group, for aircraft services in India and South Asia.

Boeing, which has pitched its F/A-18 Block III Super Hornet fighter for the India air force and navy and is competing with Lockheed Martin's F-21, said it plans to push India's armed forces' drive for modernisation through a suite of five products - the Super Hornet, KC-46 tanker, P-8I aircraft, AH-64E Apache and CH-47(I) Chinook helicopters.

The company said it wants to build a global defence and aerospace ecosystem "that creates jobs and industrial capacity with Make in India," said Salil Gupte, president, Boeing India in a statement during the exhibition.

Boeing and Lockheed will be competing with Sweden's Saab AB with its Gripen fighter and France's Dassault Aviation SA Rafale and Russian fighter aircraft.

Lockheed Martin, as part of its fighter jet F-21 proposal for the Indian Air Force, signed an MoU with Bharat Electronics Ltd on Friday to explore industrial opportunities around the F-21 fleet, which is essentially building up a spare and supply ecosystem.

The three aerospace giants, with huge displays at the Defence Expo 2020 held in the northern city of Lucknow, displayed miniaturised versions of the latest aircraft and helicopters that they have pitched to India.

Another French defence firm, Dassault, which recently delivered its first Rafale aircraft to the government in October under a contract to supply 36 units, said it is developing its facility in central India to make the Rafale jets in the subcontinent.

<https://www.asianage.com/business/companies/090220/airbus-se-boeing-co-eye-multi-billion-dollar-deals-with-india.html>

Elbit expands engagement with Indian firms

By Jon Grevatt

Bangkok: Israel's Elbit Systems has signed agreements with Indian companies at the DefExpo show in Lucknow to expand its profile in the market in unmanned systems, digital head-up display (HUD) units, and other defence technologies.

Adani Elbit Advanced Systems India, a joint venture (JV) between the Israeli company and Adani Defence and Aerospace, announced on 6 February that it will establish a design and development centre in support of unspecified military systems.

In addition, Elbit signed agreements with Hindustan Aeronautics Limited (HAL) to explore opportunities to develop and produce vertical take-off and landing (VTOL) unmanned aerial vehicles (UAVs) and to promote digital HUD units for the Indian armed forces.

The proposed design and development centre will focus on technologies for "global requirements" across air, land, and sea domains, said Adani in a press release. It also indicated that unmanned systems will be an emphasis of the new facility. "Both the teams have identified critical programmes across the entire unmanned segment," it said.

The Adani-Elbit JV also said that their existing production UAV facility in Hyderabad, which opened in late 2018, has started to export the Israeli company's Hermes 900 UAV to unidentified export customers. According to the companies, the Hermes 900 production facility is the only one outside of Israel.

Elad Aharonson, executive vice president at Elbit's ISTAR division, said, "Our enduring relationship with Adani Defence and Aerospace has shaped our joint vision to make India a global hub for manufacturing and exports of unmanned platforms."

Elbit's new arrangement with HAL will focus on "assessing the feasibility of joint development" of VTOL UAVs for maritime and land-based military operations in India and global markets, said a press release. The feasibility assessment will cover technologies, production, marketing, and maintenance of VTOL UAVs.

Under HAL and Elbit's agreement on digital HUDs, the two companies will look to promote and build the systems – incorporating new technologies – for the Indian armed forces and global customers. Elbit produces digital HUDs for aircraft including Lockheed Martin F-16s and Russian MiG-29 fighter aircraft.

https://janes.ihs.com/Janes/Display/FG_2695114-JDW

SMALL ARMS RACE

FOR LONG the Indian armed forces had just two avenues to acquire rifles, pistols and machine guns for their troops. Small arms made by the state-owned Ordnance Factory Board and direct imports. This has changed with the government opening up the sector to the private industry and issuing licences for them to manufacture and proof-test military grade arms and ammunition.

Defexpo 2020 showcased two new categories of small arms sellers — Indian private sector firms in joint ventures with foreign OEMs and, more hearteningly, Indian firms with indigenously designed developed and manufactured (IDDM) weapons. Bengaluru-based SSS Defence made its show debut displaying a range of IDDM carbines, an AK-47 upgrade and sniper rifles all



The field for manufacturing of small arms has opened up.

designed in-house. Several of their products are in advanced stages of testing by the Indian armed forces and special forces.

The Adani group too entered the race by buying out Punj Lloyd's stake in a joint venture with Israel Weapons Industry (IWI). MKU India has a joint venture with EDIC Caracal to indigenously manufacture carbines.

The reasons for this boom is not hard to see — India is one of the world's largest markets for small arms. The forces are in process of upgrading their 1980s arsenals with new weapons. There are tenders for assault rifles, carbines, sniper rifles and light machine guns worth over \$5 billion in the pipeline over this decade.

India eyes to capture Chinese-dominated African defence market

STATESMAN NEWS SERVICE

NEW DELHI, 7 FEBRUARY

Amid growing Chinese presence in Africa, India has intensified efforts to woo countries in this strategically-located continent for cooperation in the critical defence sector.

India is focusing on the region as a potential market for its domestic defence equipment, including UAVs, arms and ammunition, as the country aims to take its military exports to \$5 billion in the next five years.

"India is geared to provide Offshore Patrol Vessels, fast interceptor boats, body and vehicle armour, Night Vision Goggles, Unmanned Aerial Vehicles, Dornier aircraft and arms and ammunition to our African counterparts," defence minister Rajnath Singh said at the DefExpo 2020, being held in Lucknow. He was addressing the first India-Africa Defence Ministers' Conference, which was attended by 12 African



defence ministers and representatives from a total of 38 countries.

In a joint declaration issued last night at the end of the conference, the participating nations called for deeper cooperation in the domain of defence industry, including through investment, joint ventures in defence equipment software, digital defence, research and development, provisioning of defence equipment, spares and their maintenance on sustainable and mutually bene-

ficial terms.

Official sources said India desired to take advantage of the tremendous goodwill it enjoyed in the African continent. New Delhi has taken a number of humanitarian, economic and infrastructure initiatives in the region which have been appreciated by the leaderships of various African countries.

China obviously is India's main challenger in the region since it has made heavy investments in a number of projects in African countries.

\$5 bn in Indian defence exports by 2024

PRESSTRUST OF INDIA
LUCKNOW, 7 FEBRUARY

Defence minister Rajnath Singh on Friday said over 200 MoUs have been signed so far at the DefExpo here, asserting that the country is on its way to achieve the target of \$5 billion in defence exports by 2024.

Addressing an event at DefExpo-2020 here, he said the Centre's policy for this sector has begun delivering results.

"In 2018-19, defence exports were Rs 10,745 crore, which was seven times the exports in 2016-17. Seeing the success of this Defence expo, I am sure that by 2024 we will achieve the target of five billion dollars in defence exports," the minister said. He said so far 200 agreements have been signed during this DefExpo and described the

outcome as "historic".

Defence Secretary Ajay Kumar said the initial target for the Lucknow DefExpo was 100 Memorandums of Understanding and business agreements, but till now 200 MoUs have been signed. Kumar described it as the beginning of a new chapter in this sector. Indigenously developed products including artillery guns, helicopters, anti-tank missiles and bulletproof jackets are showcased at the DefExpo. Rajnath Singh said this reflected Indian capabilities in defence production, according to a press release. Defence manufacturing firms from across the world are participating in the five-day event inaugurated on Wednesday by PM Narendra Modi, who indicated that the country is eyeing the export target of \$5 billion by 2024.

THE ECONOMIC TIMES

Mon, 10 Feb 2020

Pakistan 'offers assistance' to Sri Lankan Air Force

Pakistan Air Force head, Air Chief Marshal Mujahid Anwar Khan, met PM Mahinda Rajapaksa in Colombo last week ahead of the latter's India visit and offered assistance for Sri Lankan Air Force, said the people

By Dipanjon Roy Chaudhury

New Delhi: Pakistan military is eyeing a comeback in Sri Lanka following the return of Rajapaksa brothers to power, even as India and Sri Lanka plan to boost their maritime security and counter terrorism partnership, according to people aware of the matter.

Pakistan Air Force head, Air Chief Marshal Mujahid Anwar Khan, met PM Mahinda Rajapaksa in Colombo last week ahead of the latter's India visit and offered assistance for Sri Lankan Air Force, said the people.

They said Pakistan is hoping to offer technical training and professional expertise to Sri Lankan Air Force, a move that will be closely monitored by India, which hosted the Rajapaksa brothers within a span of two months. During his meeting with PM Narendra Modi here last Saturday, Mahinda Rajapaksa sought partnership to fight terrorism.

During his meeting with Khan, the Sri Lankan PM reportedly acknowledged Pakistan's unwavering support to Sri Lanka in its need of hour and also underscored the need for learning from each other's experience, said one of the persons, who did not wish to be identified. Sri Lankan Air Force possesses Chinese-built inventory that enables cooperation between Pakistan and Sri Lanka.

President Gotabaya Rajapaksa and his elder brother Mahinda maintained ties with Pakistan military in the past. As a young army officer in the early 1970s, Gotabaya Rajapaksa was sent to Pakistan for an officers' training course at a time when Sri Lanka maintained strong relations with Pakistan. Later, during the war with the Liberation Tigers of Tamil Eelam (LTTE), when he was the defence secretary under his brother Mahinda's presidency, Pakistan military supported the Sri Lankan army.

It may be recalled that during the 1971 unrest that led to the creation of Bangladesh, after India withdrew landing and overflight rights to Pakistan, Sri Lanka granted refuelling facilities to Pakistan International Airlines. In March-April 1971, as the Pakistan Army launched Operation Searchlight to crush the independence movement in East Pakistan, Pakistani civilian and military aircraft made 174 landings at Katunayake international airport.

During the last decade of civil war involving the LTTE, the Pakistani military and Inter-Services Intelligence (ISI) developed close links with Sri Lanka's military including supply of defence equipment.

<https://economictimes.indiatimes.com/news/defence/pakistan-offers-assistance-to-sri-lankan-air-force/articleshow/74055199.cms>

MAIL TODAY

Mon, 10 Feb 2020

UKRAINE's military relationship with New Delhi has been confined to upgrades of India's arsenal of former Soviet era hardware like the An-32 transport aircraft and the supply of Zorya -Mashproyekt gas turbines for Indian naval warships. Projects that make up only \$ 50- \$100 million per year. A Ukrainian delegation to DefExpo led by Ukroboronprom General Director Aviras Abromavicius attempted to accelerate the relationship.

UKRAINE STEPS ON THE GAS

The Ukrainian delegation made attractive offers to upgrade of India's fleet of over 2,000 Soviet-origin T-72 battle tanks and upgrades to legacy Soviet-era air defence systems like the Osa, Tunguska, Shilka, Pechora and Igla. Tempting alternatives in the era of depressed budgets.

160 देशों में प्रतिबंधित हथियारों को अब अपना रहा अमेरिका, बनते जा रहे भावी युद्ध योजनाओं के अहम हिस्सा

अमेरिकी रक्षा विभाग पेंटागन की भावी युद्ध योजनाओं का अहम हिस्सा बनते जा रहे हैं हथियार।

तैयार किए जा रहे क्लस्टर बम और एंटी-पर्सनल लैंड माइंस जैसे घातक हथियार।

वाशिंगटन: अमेरिका में राष्ट्रपति डोनाल्ड ट्रंप इस वादे के साथ सत्ता में आए थे कि वह अंतहीन युद्धों को खत्म कर देंगे, लेकिन उनका प्रशासन अब उन हथियारों को अपना रहा है, जिन्हें दुनिया के 160 से ज्यादा देश प्रतिबंधित कर चुके हैं। क्लस्टर बम और एंटी-पर्सनल लैंड माइंस जैसे घातक हथियार भविष्य में इस्तेमाल के लिए तैयार किए जा रहे हैं। ये हथियार अमेरिकी रक्षा विभाग पेंटागन की भावी युद्ध योजनाओं का अहम हिस्सा बनते जा रहे हैं। हालांकि, अभी ऐसा कोई ठोस औचित्य नहीं बताया गया है कि क्यों इनका इस्तेमाल किया जाएगा?

अमेरिकी रक्षा मंत्री मार्क एस्पर हथियार संबंधी इस तरह की नई नीतियों का समर्थन करते हैं। इस बदलाव पर उस समय से गौर किया जा सकता है, जब वर्ष 2017 में जिम मैटिस रक्षा मंत्री थे। उस समय आए एक सैन्य रणनीति मसौदे में रूस और चीन को अमेरिका का प्रमुख प्रतिद्वंद्वी बताया गया था। इन दोनों के पास उल्लेखनीय थल सेना है और युद्ध के मैदान में दुश्मन सेनाओं को रोकने के लिए बारूदी सुरंगों का इस्तेमाल किया था।

व्यापक चर्चा के परिणामस्वरूप नीति में बदलाव

पेंटागन के प्रवक्ता जोनाथन हॉफमैन ने गत सोमवार को पत्रकारों से कहा कि विभिन्न रक्षा शाखाओं के साथ व्यापक चर्चा के परिणामस्वरूप नीति में बदलाव किया जा रहा है। हालांकि उन्होंने यह बताने से इन्कार कर दिया कि किसके कहने पर नीति बदली जा रही है। रक्षा विभाग के पूर्व अधिकारियों ने बताया कि रूस के हमले और यूक्रेन से क्रीमिया को अलग करने की घटना के विश्लेषण के दौरान प्रशासन में लैंड माइंस और दूसरे उन हथियारों पर बहस छिड़ी थी, जिनको मना किया जा चुका था। नवंबर, 2017 में मैटिस ने 2008 के एक मेमो को रद्द कर दिया था। इस मेमो में लगभग सभी क्लस्टर हथियारों के उपयोग पर रोक लगाने और इनके जखीरे को नष्ट करने का आदेश दिया गया था। ये हथियार सोवियत संघ के साथ तीसरे विश्व युद्ध के लिए तैयार किए गए थे।

1997 में हुई थी ओटावा संधि

एंटी-पर्सनल लैंड माइंस पर प्रतिबंध लगाने के लिए 1997 में ओटावा संधि हुई थी। उस समय इस पर 120 देशों ने हस्ताक्षर किए थे। अब 164 देश इस संधि का हिस्सा हैं। इस संधि को अमेरिका, रूस और चीन जैसे देशों ने नहीं अपनाया है।

<https://www.jagran.com/world/america-america-adopting-banned-weapons-in-160-countries-20014124.html>

Scientists develop portable sensors to trace explosives

By Archana Jyoti

New Delhi: Indian scientists have developed a cost-effective portable sensor that can trace explosives and toxic metals such as trinitrotoluene (TNT), trinitrophenol (TNP) and RDX even if just a few molecules are present, on the scale of parts per million (ppm). The sensor, a solution, can be easily carried in public spaces like airports, railway and hotels or sensitive areas to counter terrorism.

Developed by Dr CV Yelamaggad, and his team from Bengaluru-based Centre for Nano and Soft Matter Sciences (CeNS), an autonomous institute under the Department of Science & Technology, the solution works on the simple visual detection technique.

Talking about the concept, Dr Yelamaggad, who has been working on the technique for last 3 years, said, "It employs a fluorescent material known as coordination polymer, a hybrid system originating from the interaction between organic and inorganic moieties. This system being electron rich acts as an electron source.

"The explosive materials containing nitro groups are electron deficient and act as electron sink," he said.

"A charge transfer complex or an association of 2 or more molecules is formed between these electron sources and sink that is non-fluorescent and hence the fluorescence intensity decreases drastically which can be observed visually. The sensing can be done in solution as well in thin film forms at very minute part per billion concentrations," he further explained.

Selectivity is very perfect. Currently, there are many different kits which are being used for the sensing of explosive materials but they suffer from major drawbacks such as large size, need of repeated calibration and so on. However, solution phase developed by Dr Yelamaggad and his team can be comfortably transported and used in various places such as airports, rail stations and shopping complexes owing to its compact size and ease of handling. The simple visual detection technique makes it compatible to be used without calibration. A prototype of the sensor has been fabricated and demonstrated in the Bengaluru INDIA NANO-2018 expo under a collaborative project with Tata Steel. " We are also trying to explore possibilities to detect other explosives such as acetonitrile, benzene and toluene etc," said Dr Yelamaggad. Researchers said that with such low cost sensors they want society to be a much safer place to live. "This is not just a research but in keeping with the societal responsibilities. We still need to do a lot of investigation. If this development can help save a single life it would be a great win for me," summed up the scientist.

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