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Confident of doubling range of the Astra, will be the most lethal air to air missile: DRDO Chief

India is one of the few countries which has its own active and successful BMD programme. All essential technologies required for BMD, like propulsion system, sensors, precision control systems and terminal intercept technology with kill vehicle de...

By Manu Pubby

In this second part of an interview with ET's Manu Pubby, DRDO Chief G Sateesh Reddy describes the indigenous ASTRA missile as ready for induction and detailed how all components for the Ballistic Missile Defence system are now ready.

Two new missile projects by DRDO have stood out – the ASTRA air to air missile and the ballistic missile defence system designed to protect India against a nuclear attack. Where do we stand on these?

ASTRA initially had some technological challenges which have been overcome successfully. With our persistent effort and with active IAF support, all the user evaluation has been completed and ASTRA is now ready for induction. We are very confident of extending the range to nearly double of its existing range, making it the most lethal BVR missile.



India is one of the few countries which has its own active and successful BMD programme. We have demonstrated our capability through both simulation studies as well as live target engagements in both endo and exo regions. All essential technologies required for BMD, like propulsion system, sensors, precision control systems and terminal intercept technology with kill vehicle development have matured and have been proven through various tests.

After the success of the Anti-Satellite test, what are the next plans for DRDO in the field of space?

With the ASAT test, DRDO has demonstrated the capability to neutralize enemy satellites. We are not in favour of weaponization of space. However, we need to have technological capabilities to defend our national interest. DRDO will keep working in the area of advanced technologies for air and missile defence systems. Future activities will depend on the guidelines of the government.

Another focus area for the government is encouraging defence exports. What steps need to be taken for this?

The government has come out with several policies to promote exports. We are creating awareness of DRDO-developed products and systems by showcasing them in international defence and aero shows. Many countries have shown keen interests for different systems. We will support the industry with technologies to enhance their export competitiveness. Royalty has been reduced for DRDO products being exported to friendly nations. Free handholding support has been extended for the industry for absorbing the technology.

Is there a possibility of the Arjun Tank and its advanced variants also being ordered in significant numbers in the near future?

MBT Arjun is one of the most potent fighting platforms in its class. Mark I is inducted and being used by Army. Mark IA has gone through extensive use trials. Two Regiments of upgraded Arjun Mk IA are in the process of being inducted.

On talent acquisition, how has DRDO fared, especially as private companies offer attractive financial options for bright young scientists and engineers.

Nowadays DRDO is a preferred employer and we are able to get talent from prestigious institutes. Prospects for career growth are good with schemes like Merit based flexible Complementing Scheme. Financial incentives are also good with provision of variable increment based on performance. Scientists are also sponsored for higher studies and are deputed abroad for various conferences, seminars etc. There are various awards in recognition to performance of scientists.

Can you please share an update on the Agni program and the next steps planned for it.

Development of Agni Series of missiles has been completed and are in the process of induction.

<https://economictimes.indiatimes.com/news/defence/confident-of-doubling-range-of-the-astros-will-be-the-most-lethal-air-to-air-missile-drdo-chief/articleshow/72120351.cms>

THE ECONOMIC TIMES

Wed, 20 Nov 2019

View: India must tap private sector for closing tech gap with global military powers

Defence production and R&D will not make the desired leap unless MoD proactively supports the private sector in manufacturing and R&D, and revamps the DRDO. It is time the MoD tapped the entrepreneurial energies of the private sector to bridge the...

By G Mohan Kumar

The appointment of a chief of defence staff (CDS) in the Ministry of Defence (MoD) is bound to energise decision-making as defence planning will get rationalised through an objective evaluation of demands put forth by the services for modernisation. Under the leadership of the CDS, the long-term integrated perspective plans, the mainstay of the modernisation programme of the services, have a great opportunity to take off in the right direction. But the plans will fail if India continues to rely heavily on imports without indigenous production of major equipment such as fighter aircraft, helicopters and submarines backed by robust research and development.

The recent speech by the defence minister calling upon the Defence Research and Development Organisation (DRDO) to concentrate on high-end, futuristic areas of technology is a pointer to the infirmities of our defence R&D. Defence production and R&D will not make the desired leap unless MoD proactively supports the private sector in manufacturing and R&D, and revamps the DRDO.

Domestic defence manufacturing has to survive in a monopsony (government is the sole buyer). This necessitates specialisation and longterm commitment to investment in product development and maintenance. The strategic partnership (SP) policy was incorporated in the defence procurement procedure to harness the latent capabilities of the private sector for production of major equipment by nurturing a sophisticated ecosystem of small and medium component manufacturers.

In advanced countries, defence production is dominated by a small group of private companies backed by a plethora of small firms. They have longterm partnerships with their governments in both R&D and production. The governments exercise strong regulatory control over their activities in both manufacturing and export. But a monopolistic private sector is unthinkable in our country, which has given constitutional protection to public sector monopoly. Article 19(6)ii provides for restricting fundamental rights in favour of the public sector. This could perhaps be extended to the private sector also by legitimising monopolies in strategic areas like defence in larger national interest.

It is time the MoD tapped the entrepreneurial energies of the private sector to bridge the technological gap between India and the advanced military powers. Some years ago an expert committee had recommended a system of recognising competent private firms as 'udyog ratnas' to be treated on a par with the public sector. Later the Atre committee, which laid the foundation for the SP policy, strongly recommended selection of private firms for long-term partnerships and contracts on the basis of cost-plus pricing. This met with stiff resistance both at the bureaucratic and political levels and the SP policy was framed after substantially watering down the original recommendations.

The elemental fear of the trinity comprising the CVC, CBI and CAG once again put paid to a highly ambitious reform effort. After the unseemly political spat over the offsets of the Rafale deal, the RFI (Request for Information) for the single-engine fighter project was recalled and revised in a kneejerk fashion to allow the public sector also to compete. With the HAL struggling to honour the deadlines for delivery of Tejas – for which it has a good order from the MoD – its capability to deliver another single-engine aircraft within the stipulated time is questionable. So much for progressive policymaking – often starting with a bang and ending in a whimper. The imperatives of national security are overridden by incurable conservatism.

The defence minister's exhortation to the DRDO raises questions on the trajectory of defence R&D. With China challenging the USA in contemporary technologies such as the 5G, artificial intelligence, fifth generation fighter aircraft and electronic warfare, do we have the resolve to narrow the technology gaps?

We have to reflect deeply on defence R&D being a monopoly of the DRDO. While the DRDO has done excellent work in some advanced areas, its unfocused organic growth in all directions has rendered it unwieldy. India has made little headway in developing high-tech materials like high grade alloys for use in defence equipment. Unless we achieve a breakthrough in this field, development of aero-engines and other high performance equipment will remain a pipe dream.

Advanced countries have successfully harnessed the energies of the private sector for R&D. The most wellknown example is the Defence Advanced Research Projects Agency (DARPA) of the US Department of Defence which created a transformational innovation ecosystem in partnership with the private sector with regulatory control over Intellectual Property Rights (IPR) and export.

In India, when a private company develops products even for the DRDO, there is no system to guarantee orders to the developer to make manufacturing commercially viable. A conscious effort is needed to downsize the DRDO and earmark substantial funds to involve the private sector in R&D with clear demarcation of the rights and responsibilities. While the DRDO could handle areas such as strategic systems and missile technology, it has to be a facilitator for research in other areas through public-private partnership with the active oversight of the three services. There is a need to enact a legislation to facilitate such partnerships and to safeguard IPR and national interests. The DRDO needs to have the flexibility to hire worldclass talent. The final answer may lie in the DRDO being converted into an autonomous research foundation, overseen by an independent board of distinguished scientists and senior members of the three services.

(The writer is a former defence secretary)

<https://economictimes.indiatimes.com/news/defence/view-india-must-tap-private-sector-for-closing-tech-gap-with-global-military-powers/articleshow/72136590.cms>

How Defence Minister Rajnath Singh would boost defence sector with global investors

Rajnath Singh on Monday invited global investors to invest in aerospace and defence goods and services in order to raise employment and reduce import dependence

By Vinayak Sharma

While addressing the gathering at (ADMM-plus) ASEAN Defence ministers' meet n Bangkok, Defence Minister Rajnath Singh invited global defence majors and investors to India's defence sector. He stated that India has planned to set a target of being the nation to export military equipments worth \$5 Billion by 2025.

Employment

Eyeing the employment count, Singh stated that targeting the aerospace, defence goods and services areas, India is planning to invest around \$10 Billion in these sectors which would bring a jump in the employment percentage of the country. According to Business Today, Singh mentioned that around 2 to 3 Million people would get jobs in these sectors as the demand for goods and services will rise along with the major investment in specific work spheres.

ToT (Transfer of Technology)

Introducing the new policy at the Bangkok meet, Defence Minister mentioned that new policy of ToT (Transfer of Technology) was being formulated to ease the process of transferring the technology developed by DRDO (Defence Research and Development Organisation) to the defence industry. Recently, DRDO has signed 30 agreements related to ToT with 16 Indian companies which also include 3 start-ups. Indian Armed Forces are procuring ready-to-eat meals, survival rations and emergency flying ration products from companies which have acquired ToT from DRDO. And now, Defence Minister has made global players familiar with ToT and invited them to engage in the process.

Reduce Import dependence

At the meet, Singh said that Defence Sector has been prioritized under 'Make in India' initiative and it is aimed at reducing the import dependence and driving the nation to become the net exporter of defence equipments and services. According to export.gov, at present India imports around 60 per cent of the defence needs. In comparison to the export figures, India has imported defence requirement worth around \$10, 819 Million in 2019 from \$6,770 Million in 2016. Export figures reached to \$7,461 Million in 2019 from \$5,395 Million in 2016. To reduce the import count, Singh urged the global and domestic manufacturers to be a part of 'Make in India' initiative and fulfil the defence needs. 'Make in India' is one of the biggest initiatives of Indian government to attract investors to invest in India for defence requirements.

New Defence Category (Buy Indian-IDDM)

Defence Minister Rajnath Singh also described the new defence policy upgrades that have been helpful in the sector's development. Singh mentioned the defence procurement procedure was transformed in 2016 to encourage the domestic defence industry. A new category Buy Indian - IDDM (Indigenously Designed, Developed and Manufactured) was introduced to forge ahead with the design and development of defence equipment. He introduced it at the Bangkok meet for the global interest and also to increase domestic involvement in the category.

About ASEAN (ADMM-Plus)

Rajnath Singh is in the Bangkok to attend ASEAN defence ASEAN Defence Ministers' Meeting-Plus (ADMM-Plus) grouping, a platform including ASEAN and its eight dialogue partners including India. At the meet Singh stated the government's decision to promote self-reliance in defence sector with five 'I'-Identification, Incubation, Innovation, Integration and Indigenisation. Defence Minister invited global and domestic speculators to be a part of the upcoming DefExpo to be held in Lucknow in February 2020.

<https://www.entrepreneur.com/article/342612>



Wed, 20 Nov 2019

Rajinder Singh: 'Make in India, imperative in defence production'

Rajinder Singh Bhatia, President, CEO of the Defence Aerospace Division, addressed the officers of the three services of the Indian Armed Force on Tuesday

By Nisha Qureshi

Mumbai: Rajinder Singh Bhatia, President and CEO of the Defence Aerospace Division, Kalyani Group, addressed the officers of the three services of the Indian Armed Forces on Tuesday at the Strategic Partnership: Analysis and Way Forward conference.

'Make in India, imperative in defence production'

Rajinder Bhatia spoke about how the 'Make in India' initiative is important for defence production. He also said that the initiative will bridge broader participation of the private sector in defence production.

"Make in India is not an option but an imperative and further analysed the data pertaining to the manufacturing industry in India, its impact on GDP and also brought out how strategic partnership model will encourage broader participation of private sector in defence production," he said.

'We are confident that we will fight and win the next war through indigenous weapons'

Earlier, Army Chief General Bipin Rawat, while addressing the 41st DRDO (Defence Research and Development Organisation) Directors Conference in New Delhi, stated the importance of technology in warfare.

Emphasising on the need for homegrown solutions for the Indian Defence, the Army Chief stated that India must look forward to using homegrown solutions for defence technology and lauded the DRDO's efforts in doing so. The Army Chief also stated that he is confident that India will win the next war through homegrown solutions.

"DRDO has made strides in ensuring that the requirements of the services are met through home-grown solutions. We are confident that we will fight and win the next war through indigenous weapons systems and equipment," he said.

The Army Chief also said that India is looking at ways to develop systems of future warfare and said India needs to prepare for contact war.

<https://www.republicworld.com/india-news/general-news/rajinder-singh-make-in-india-imperative-in-defence-production.html>

NEW CDS APPOINTMENT NORMS

SELECTION criteria and tenure are the most contentious issues that are still being discussed before the awaited announcement of the Chief of Defence Staff (CDS) as the government is readying to finalise the terms of reference and the nature of the highest military post.

Sources said while the implementation committee report to decide the structure of the office of CDS is under consideration at highest levels, issues like selection, age, the question till when CDS can be in office and tenure are some of the sticky points. "There is still no clarity on these issues and deliberations are continuing at various levels," said an official.

A source said while it is clear that the CDS will be picked

from among the serving military officials and appointing a retired person is ruled out the selection criteria is still being discussed. The CDS will be a post that will be a single point advisory body to the government on all military matters. "The implementation committee report is at an advanced stage with regards to the charter, role and duties but selection, age and tenure and some areas that need to be decided," said an official.

Should it be one of the serving chiefs or a deep selection process from a larger pool of officers should take place?

This is a big question leading to further dilemmas before the government makes the big announcement.

— Abhishek Bhalla

The CDS will be picked from among serving military officials.

आर्मी यूनिफॉर्म होगी ज्यादा स्मार्ट और आरामदायक

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■ नई दिल्ली : इंडियन आर्मी की यूनिफॉर्म में बदलाव की प्रक्रिया शुरू की गई है। आर्मी की कॉम्बेट यूनिफॉर्म सहित सभी तरह की यूनिफॉर्म को ज्यादा आरामदायक ज्यादा स्मार्ट बनाने के लिए इंडस्ट्री से सैंपल मंगाए गए



हैं। सूत्रों के मुताबिक जो सैंपल आए हैं उनका प्रजेंटेशन बुधवार या गुरुवार को आर्मी चीफ जनरल बिपिन रावत के सामने किया जाएगा। बदलाव की इस कवायद का मकसद यूनिफॉर्म में समानता लाना भी है। आर्मी सूत्रों के मुताबिक बदलती ऑपरेशनल जरूरतों को ध्यान में रखते हुए यूनिफॉर्म में बदलाव की कवायद शुरू की गई है। फौज को ज्यादा आरामदायक यूनिफॉर्म उपलब्ध कराने के मकसद से भी यह किया जा रहा है। आर्मी की कॉम्बेट ड्रेस, समर और विंटर की रेगुलर ड्रेस, सेरिमोनियल ड्रेस, मेस की ड्रेस सभी में बदलाव की कोशिश की जा रही है। आर्मी सूत्रों के मुताबिक हर मौसम की यूनिफॉर्म को ज्यादा आरामदायक बनाने के लिए इसके फैब्रिक में बदलाव होगा। साथ ही डिजाइन में भी कुछ बदलाव हो सकता है ताकि वह ऑपरेशनल जरूरतों के हिसाब से ज्यादा आरामदायक बने।

Army turns up heat on 'leaks'

By **Abhishek Bhalla** in New Delhi

THE Indian Army has sent out a strong warning to its personnel in case of information leakage. It also urged the commanders to execute "harsh punishments" against those who do not report on information leaks.

The move was prompted following several cases of sensitive information getting out in the public domain. The Army has identified nearly 150 social media profiles with fake identities involved in trapping to seek secret information.

"Non-reporting of information leakage is a serious offence and defaulters will be severely punished. Harsh punishments must be given by commanders to those who neglect the warning. No soft approach should be tolerated," said the Army in a recent advisory.

"The leakages of military information by service peers knowingly or unknowingly is a serious offence and needs to be treated strictly. Commanders at all levels to arrest the menace," the advisory added.

Strict guidelines on telephonic authentication protocol must also be taken to identify the caller before speaking.

Sources said a new trend has also been noticed wherein Pakistan Intelligence Operatives use a number of foreign countries to target the Indian military personnel.

In many cases, operatives have successfully infiltrated the army communication networks disguised as security officials from other forces and wings, said sources.

The major targets of Pakistan Intelligence Operatives in order to extract information are exchange operatives, adjutants of various units, and even former servicemen.

All formations should be sensitised and encouraged to use Tri-Services dialling scheme while calling and communicating with sister services, the advisory says.

THE ASIAN AGE

Wed, 20 Nov 2019

COUNTRIES LIKELY TO EMERGE AS MAJOR CYBERTHREATS IN THE 2020s

IN THE WAKE OF CONFIRMED MALWARE ATTACK IN KUDANKULAM NUCLEAR POWER PLANT AND ATM NETWORKS IN INDIA BY STATE-BACKED ACTORS FROM NORTH KOREA, WE TAKE A LOOK AT SOME OF THE WELL-KNOWN NATION-STATE HACKERS AND UPCOMING ONES.

■ Since the dawn of web, countries such as Russia, China, Iran and North Korea have been engaging in and Isro campaigns against Western targets.

■ Even Western governments are spending big on their own cyber-espionage expertise too of course, and one of the most high-profile cyberattacks, the Stuxnet worm used against the Iranian nuclear project, was led by the US.

■ However, the more worrying trend is that the threat of state-backed hackers is likely to grow even more over the next decade as a new set of countries are keen to use the same tactics as some of their larger and more powerful rivals.



■ Cybersecurity experts say that the true spectrum of cyber operations are cognitive as deterrence in cyberspace could be extremely bizarre and challenging.

■ One of rising contenders among the state-backed hackers is APT 32, also known as OceanLotus. It is a group working out of Vietnam that appears to work on behalf of the interests of its government.

■ In Pakistan, the Gorgon Group isn't just only evolving techniques, but also playing a balancing act between performing nation-state based activity and more traditional cyber-crime.

■ In West Asia, Advanced Persistent Threat (APT) hacking groups are increasing the use of malware to target journalists and human-rights activists in the region.

■ Since the Shadow Brokers leak that released some of US National Security Agency's secret tools into the wild, new techniques and tools are becoming available to hacking units outside of the big four. Thus, it's only going to get easier for smaller players to grab a piece of the cyber pie.

■ Some of these tools have already been used in offensive operations.

■ Till date, much of the state-backed hacking still takes the form of cyber espionage —attempts to steal data on government personnel or on expensive defence projects. Sometimes this data is used by the governments themselves, sometimes it is passed on to businesses within their own countries.

■ But not all state-backed hackers are after industrial secrets. The US has, for example, regularly warned that the networks that control much of its critical infrastructure — including financial systems and power grids — are probed for vulnerabilities by foreign governments and criminals. This could be seen as nations doing the ground work for future more dangerous incidents.

■ Worse, nation-state hackers may be interested in creating physical effects by digital means — bringing down a power grid or forcing open the doors of a dam at the wrong time, for example. This is where cybercrime tips over into cyberwarfare.

The countries in West Asia tend to rely heavily on expertise from outside contractors, but it's not beyond the realms of possibility that their knowledge could be absorbed by home-grown talent



Often the way you see the initial reporting on this is targeting of individuals inside the country first. In those cases the attacks target people who are classified as dissidents or against the government and the government is using cyber activity to track them and find them

— RYAN OLSON
VP (threat intelligence), Unit 42

From Sun and Venus missions to Space Station, 8 amazing future missions of ISRO you must know!

The Indian Space Research Organisation or ISRO is on a roll! Notwithstanding the setback faced during the soft-landing of Vikram Lander during the Chandrayaan 2 mission, ISRO has set its sight on higher goals and is pushing the boundaries in space science with every mission. While ISRO is shortlisting candidates to be part of its first manned-mission in space, it is also planning to send missions towards the Sun and Venus and even setting up India's own space station. Here's a list of eight amazing missions ISRO will carry out in the next decade or so:

1] Aditya – L1: This will be India's first mission to study the Sun. Planned to be launched during the first half of 2020 using ISRO's PSLV-XL rocket from Sriharikota, Aditya-1 will study the solar corona. It is the outer layer of the Sun which extends thousands of kilometers above the disc or photosphere. It is one of the hottest spots in the solar system where temperature ranges above a million degree Kelvin. This extremely high level of temperature is still a mystery in solar physics and Aditya - L1 will try to find an answer to that.

2] Shukrayaan: ISRO's planned mission for Venus is scheduled for a mid-2023 launch. Venus is very similar to Earth in terms of its size, density, mass, gravity and bulk composition and is often called Earth's "twin sister". While the surface of Venus is one of the hottest places in the solar system, its atmosphere above the gaseous clouds is a totally different world. ISRO's Venus mission Shukrayaan will study atmospheric chemistry, dynamics and compositional variations of Venus and also find out surface/sub surface features and re-surfacing processes.

3] Chandrayaan 3: ISRO has planned another soft-landing attempt on lunar surface with Chandrayaan 3 in November next year. After the setback of September, ISRO is preparing a detailed report on the proposed Chandrayaan 3. According to media reports, ISRO is eyeing the launch window in November 2020 and learning from its Chandrayaan 2 experience and the agency will focus on rover, lander and landing operations more this time.

4] Gaganyaan: ISRO is moving ahead with its first indigenous manned-space mission called Gaganyaan. According to reports, Gaganyaan will remain in space for seven days with three Indian astronauts who will be called "Gaganauts" for this mission. ISRO recently shortlisted 12 IAF pilots with the help of Russian experts for the mission. Gaganyaan is scheduled for lift-off in 2022.

5] Mangalyaan 2: Mars Orbiter Mission 2 or MOM-2, also known as Mangalyaan, will be India's second inter-planetary mission to the Red Planet. It is expected to be launched in a suitable window in the near future. Mangalyaan 2 will take forward the studies conducted by Mangalyaan including exploring possibility of water and life on Mars.

6] India's own space station: By 2030, ISRO plans to have its own space station like the International Space Station or ISS currently orbiting around the Earth. In June 2019, ISRO chief K Sivan announced that India's space station module will be a smaller one compared to ISS and it will carry out microgravity operations.

7] NISAR: India's ISRO and America's NASA space agencies have decided to work together! Their joint project will be called NISAR. NISAR will study hazards and global environmental changes. NISAR is being developed to observe and measure some of the Earth's most mind-boggling processes like ice-sheet collapse, ecosystem disturbances and natural hazards such as tsunamis, earthquakes, landslides and volcanoes.

8] **Mission to study deep space:** There are plans to launch a mission to study phenomenon's beyond our solar system including black holes and pulsars, neutron stars, supernova remnants, etc.

<https://www.defencenews.in/article/From-Sun-and-Venus-missions-to-Space-Station,-8-amazing-future-missions-of-ISRO-you-must-know!-768050>

पंजाब केसरी

Wed, 20 Nov 2019

कार्टोसेट-3 उपग्रह का प्रक्षेपण 25 को

बेंगलुरु, (भाषा) : भारतीय अंतरिक्ष अनुसंधान संगठन (इसरो) 25 नवंबर को पृथ्वी की तस्वीरें लेने वाले उपग्रह कार्टोसेट-3 और अमेरिका के 13 वाणिज्यिक नैनो उपग्रह का प्रक्षेपण करेगा। इसरो ने बताया कि उपग्रहों का प्रक्षेपण आंध्र प्रदेश के श्रीहरिकोटा में सतीश धवन अंतरिक्ष केंद्र से पीएसएलवी-सी47 के जरिए किया जाएगा। प्रक्षेपण 25 नवंबर 2019 को भारतीय समयानुसार नौ बजकर 28 मिनट पर किया जाएगा। कार्टोसेट-3 तीसरी पीढ़ी का बेहद आधुनिक और कुशल उपग्रह है जिसकी अच्छी तस्वीर लेने की क्षमता है। पीएसएलवी-सी47 के साथ अमेरिका के 13 वाणिज्यिक नैनो उपग्रह भी प्रक्षेपित किए जाएंगे। अमेरिका के नैनो उपग्रहों को अंतरिक्ष विभाग के न्यूस्पेस इंडिया के साथ हुए व्यावसायिक समझौते के तहत अंतरिक्ष में भेजा जा