

Jan
2021

समाचार पत्रों से चयित अंश Newspapers Clippings

A Daily service to keep DRDO Fraternity abreast with DRDO Technologies, Defence Technologies, Defence Policies, International Relations and Science & Technology

खंड : 46 अंक : 02 02-04 जनवरी 2021
Vol.: 46 Issue : 02 02-04 January 2021



रक्षा विज्ञान पुस्तकालय
Defence Science Library
रक्षा वैज्ञानिक सूचना एवं प्रलेखन केंद्र
Defence Scientific Information & Documentation Centre
मेटकॉफ हाउस, दिल्ली - 110 054
Metcalf House, Delhi - 110 054

CONTENTS

S. No.	TITLE	Page No.
DRDO News		1-13
DRDO Technology News		1-13
1.	DRDO Celebrates Foundation Day	1
2.	డి.ఆర్.డి.ఓ. 63వ వ్యవస్థాపక దినోత్సవం	3
3.	63वां स्थापना दिवस: रक्षा मंत्री राजनाथ ने कहा- डीआरडीओ की उपलब्धियों पर देश को गर्व	5
4.	डीआरडीओ प्रमुख ने वैज्ञानिकों से साइबर सुरक्षा, अंतरिक्ष, कृत्रिम बुद्धिमत्ता पर फोकस करने कहा	6
5.	DRDO Chief called upon scientists to focus on next-gen needs	7
6.	DRDO Chairman asks scientists to focus on next-generation needs like AI, cybersecurity	8
7.	DRDO Scientist explains Why Akash missile beats BrahMos & All others as India's most sought-after export weapon	9
8.	Bharat Dynamics all set for exporting Akash missiles	11
9.	DRDO boost to mushroom farming for income generation in northeast	11
10.	Training imparted on mushroom farming	12
Defence News		13-25
Defence Strategic National/International		13-25
11.	Gen Rawat reviews India's military readiness for 2nd day in AP border areas	13
12.	Nothing can deter Indian forces: CDS Rawat at LAC	14
13.	Armed forces resolutely countered adversaries along borders in 2020	15
14.	Budgeting for India's defence	17
15.	Major reshuffle in Army, Lt Gen Shantanu Dayal to take charge as Deputy Chief of Staff	18
16.	Surgeon Vice Admiral Rajat Datta takes over as Director General Armed Forces Medical Services	19
17.	GRSE delivers last landing craft utility ship to Indian Navy	19
18.	After Predator drone lease, government approves Indian Navy proposal to buy shipborne drones	20
19.	Ramp up defence production facilities to join the top three	21
20.	Himalayan Impasse India-China standoff	23
21.	US' 'Black Hawk' clone Chinese 'Z-20' helicopters ready for attack missions with KD-10 missiles	24
Science & Technology News		25-30
22.	ISRO hints at virtual launch & satellite control in future	25
23.	Reusable rockets, satellite constellation for broadband in ISRO's 10-year plan	26
24.	See live cells with seven times greater sensitivity using new microscopy technique	27
COVID-19 Research News		29-30
25.	Vaccine approval a decisive turning point in fight against coronavirus: PM Modi	29



**Press Information Bureau
Government of India**

Ministry of Defence

Fri, 01Jan 2021 05:52PM

DRDO Celebrates Foundation Day

DRDO today observed the 63rd Foundation Day of its establishment. Dr G Satheesh Reddy, Secretary DDR&D & Chairman DRDO met Raksha Mantri Shri Rajnath Singh and presented him a model of Akash Missile System, which is recently cleared for export. On the occasion, Chairman DRDO along with DGs and Directors of DRDO HQ paid floral tributes to Dr APJ Abdul Kalam at DRDO Bhawan.

DRDO was established in 1958 with just 10 laboratories to enhance the research work in Defence sector and was tasked with designing and developing cutting edge defence technologies for Indian Armed Forces. Today, DRDO is working in multiple cutting edge military technology areas, which include aeronautics, armaments, combat vehicles, electronics, instrumentation, engineering systems, missiles, materials, naval systems, advanced computing, simulation, cyber, life sciences and other technologies for defence.

Addressing DRDO fraternity, Chairman DRDO extended warm wishes to DRDO employees and their families. He stated that an eventful year has passed and a new one is about to begin and asked scientists to innovate and create for the Nation. He said that efforts of DRDO have given a quantum jump to India's self reliance in defence, contributing towards Aatmanirbhar Bharat.



He declared Export as the theme of DRDO for 2021 and mentioned that many products based on DRDO technologies have already been exported by DPSUs and Industry. DRDO develops critical defence technologies and products to meet the requirements of the Indian Armed Forces.

He said that in 2020, DRDO achieved many milestones such as maiden landing of LCA Navy onboard INS Vikramaditya, demonstration of Hypersonic Technology Demonstration Vehicle (HSTDV), Quantum Key Distribution (QKD) & QRNG developments in area of Quantum Technology, Laser Guided Anti Tank Guided Missile (ATGM), Supersonic Missile Assisted Release of Torpedo (SMART), Anti Radiation Missile (NGARM), enhanced version of PINAKA Rocket System, Quick Reaction Surface to Air Missile (QRSAM), Maiden launch of MRSAM, 5.56 x 30 mm Joint Venture Protective Carbine (JVPC) and many other milestones.

He highlighted the contributions of DRDO during COVID Pandemic and said that nearly 40 DRDO laboratories developed more than 50 technologies and over 100 products on war footing to

develop products & technologies for combating COVID 19 pandemic in India. These included PPE kits, Sanitizers, Masks, UV Based disinfection systems, Germi Klean and critical parts of ventilator leading to ventilator manufacturing in the country in a very short span of time. He further said that DRDO has established three dedicated COVID hospitals at Delhi, Patna and Muzaffarpur in a record time for strengthening the medical infrastructure. In addition, Mobile Virology Research and Diagnostics Laboratory (MVRDL) were developed to speed-up the COVID-19 screening and R&D activities at various locations for strengthening the COVID testing capabilities.

He mentioned that new policies and procedures were launched for increasing the efficiency and ease of engagement with various stakeholders in the development. DRDO has also taken major steps for further strengthening its base for taking up technological challenges for the defence systems development and will continue to strive for the best in defence technology and ensure the system development in the shortest time.

While congratulating DRDO Scientists and all other personnel who worked in close coordination with the Armed Forces for user trials, he set many targets for them. He talked about the flagship programmes of DRDO such as Hypersonic Cruise Missile, Advanced Medium Combat Aircraft (AMCA), New Generation MBT, Unmanned Combat Aerial Vehicle, Enhanced AEW&CS, LCA MK II and many other systems.

In his speech, he called upon DRDO scientists to focus on next generation needs including cyber security, space and artificial intelligence.

The immense potential available in DRDO has been a catalyst for the development of industries in defence manufacturing sector.

He highlighted that the academic institutes, R&D organizations and industry need to work together on the advanced and futuristic technologies to make India self-reliant in defence sector. He mentioned that a number of SMEs and MSMEs are supplying small components to subsystems for all DRDO projects and have been nurtured by DRDO. Now they have become partners in all new developments. He stated that DRDO conducted a competition “Dare to Dream” for Startups and very enthusiastic response have been received. He further added that at least 30 Startups should be supported every year to develop innovative products for our forces.

He said that DRDO should make efforts towards strengthening long term ties with the Academia and aim to leverage the academic expertise available in the country and increase the synergy with them. DRDO should concentrate on applied research and translational research and then make prototypes from the applied research. He further said, that the industry should be in a position to adopt these technologies and have necessary infrastructure, and scale these up to market with sustained quality.

He underlined the need to focus on documentation and productionisation for faster induction and said that many new initiatives towards enabling the industry and empowering youth for Defence R&D will be taken by DRDO.

Chairman DRDO also launched an Online Industry Partner Registration Module to simplify the process of vendor registration. He released the DRDO Monograph on “Issues on Development of Communication Technology using Orbiting Satellites” and also the Environmental Safety Manual and Guidelines for Disposal of Life Expired Chemicals and Gases at DRDO Laboratories.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1685407>



రక్షణ మంత్రిత్వ శాఖ

Fri, 01Jan 2021 05:52PM

డి.ఆర్.డి.బి. 63వ వ్యవస్థాపక దినోత్సవం

రక్షణ, పరిశోధన అభివృద్ధి సంస్థ (డి.ఆర్.డి.బి.) 63వ వ్యవస్థాపక దినోత్సవం ఈ రోజు జరిగింది. ఈ సందర్భంగా,..ఇటీవల ఎగుమతికి అనుమతించిన ఆకాష్ క్షిపణి వ్యవస్థ నమూనాను,.. రక్షణ పరిశోధనా, అభివృద్ధి డైరెక్టరేట్ కార్యదర్శి, డి.ఆర్.డి.బి. చైర్మన్ డాక్టర్ జి. సతీష్ రెడ్డి కేంద్ర రక్షణ మంత్రి రాజనాథ్ సింగ్.కు సమర్పించారు. మరో వైపు..డి.ఆర్.డి.బి. భవన్ లో జరిగిన కార్యక్రమంలో సంస్థ చైర్మన్.తో పాటుగా డైరెక్టర్ జనరల్స్, డి.ఆర్.డి.బి. ప్రధాన కార్యాలయం డైరెక్టర్లు దివంగత మాజీ రాష్ట్రపతి డాక్టర్ ఎపిజె అబ్దుల్ కలాంకు పుష్పాంజలి ఘటించారు.

రక్షణ రంగంలో పరిశోధనను పెంపొందించేందుకు, భారతీయ సాయుధ బలగాలకోసం అత్యాధునిక రక్షణ సాంకేతిక పరిజ్ఞానాల రూపకల్పన లక్ష్యంగా 1958లో కేవలం పది లేబరేటరీల వ్యవస్థతో డి.ఆర్.డి.బి. ఏర్పాటైంది. ఈ రోజున సైన్యానికి అవసరమైన అనేక అత్యాధునిక సాంకేతిక పరిజ్ఞాన రంగాలలో డి.ఆర్.డి.బి. కృషిని కొనసాగిస్తోంది. రక్షణ రంగంకోసం ఏరోనాటిక్స్, ఆయుధ సంపత్తి, యుద్ధ వాహనాలు, ఎలక్ట్రానిక్స్, ఇన్స్ట్రుమెంటేషన్, ఇంజనీరింగ్ వ్యవస్థలు, క్షిపణులు, నావికా వ్యవస్థలు, అధునాతన కంప్యూటింగ్, సైబర్ రంగం, జీవన శాస్త్రాలు తదితర సాంకేతిక పరిజ్ఞాన రంగాల్లో డి.ఆర్.డి.బి. తన పరిశోధనను కొనసాగిస్తోంది.

వ్యవస్థాపక దినోత్సవం సందర్భంగా డి.ఆర్.డి.బి. సిబ్బందిని ఉద్దేశించి సంస్థ చైర్మన్ ప్రసంగిస్తూ, ఉద్యోగులకు, వారి కుటుంబ సభ్యులకు శుభాకాంక్షలు తెలిపారు. అనేక ఒడిదుడుకులతో కూడిన సంవత్సరం ముగిసిందని, మరో కొత్త సంవత్సరం మొదలవుతోందని అన్నారు. డి.ఆర్.డి.బి.లో జరుగుతున్న కృషితో భారత్ స్వావలంబన దిశగా ఎంతో పురోగమించిందని, ఆత్మనిర్భర భారత్ లక్ష్య సాధనకు ఇది దోహదపడుతోందని డాక్టర్ సతీష్ రెడ్డి అన్నారు.

2021వ సంవత్సరానికి ఎగుమతే డి.ఆర్.డి.బి. ప్రధాన లక్ష్యమని, డి.ఆర్.డి.బి. అందించిన సాంకేతిక పరిజ్ఞానంతో రూపుదిద్దుకున్న పలు ఉత్పాదనలను ప్రభుత్వ రంగంలోని రక్షణ సంస్థలు, పరిశ్రమలు ఇదివరకే ఎగుమతి చేశాయని అన్నారు. భారతీయ సాయుధ బలగాల అవసరాలకు తగినట్టుగా కీలకమైన రక్షణ సాంకేతిక పరిజ్ఞానాలను, ఉత్పాదనలను డి.ఆర్.డి.బి. రూపొందిస్తుందని అన్నారు.

2020లో డి.ఆర్.డి.బి. అనేక విజయాలు సాధించిందన్నారు. భారతీయ నావికాదళానికి చెందిన ఐ.ఎన్.ఎస్. విక్రమాదిత్య నౌకపై నావికాదళం తేలికరకం యుద్ధవిమానాన్ని తొలిసారి దింపడం, శబ్దవేగానికి మించిన సాంకేతిక పరిజ్ఞాన ప్రదర్శన వాహనం, క్వాంటమ్ కీ డిస్ట్రిబ్యూషన్,, క్వాంటమ్ టెక్నాలజీ పరిణామాలు, లేజర్ చోదక ట్యాంకు విద్వంసక క్షిపణి, జలంతర్గామి విద్వంసక యుద్ధ సామర్థ్యాన్ని నిర్ధారించే స్పార్ట్ సాంకేతిక పరిజ్ఞానం, యాంటీ రేడియేషన్ క్షిపణి (ఎన్.గార్మ్), మెరుగుపరిచిన పినాకా రాకెట్ వ్యవస్థ, భూతలంనుంచి గగనతలానికి ప్రయోగించగలిగే సత్వర ప్రతిస్పందనా క్షిపణి రూపకల్పనతో పాటు ఇలాంటి మరెన్నో విజయాలను డి.ఆర్.డి.బి. సాధించిందన్నారు. .

కోవిడ్ మహమ్మారి వ్యాప్తి సమయంలో డి.ఆర్.డి.బి. ఎన్నో సేవలందించిందని, కోవిడ్ పై పోరాటం, వైరస్ వ్యాప్తి నియంత్రణ లక్ష్యంగా దేశంలోని దాదాపు 40 డి.ఆర్.డి.బి. లేబరేటరీలు 50రకాల సాంకేతిక పరిజ్ఞానాలకు యుద్ధ ప్రాతిపదికన రూపకల్పన చేశాయని అన్నారు. డి.ఆర్.డి.బి. రూపకల్పన చేసిన ఉత్పాదనల్లో వ్యక్తిగత రక్షణ కిట్లు (పి.పి.ఇ. కిట్లు),

శానిటైజర్లు, మాస్కులు, అతినీలలోహిత కిరణాల ఆధారంగా పనిచేసే సూక్ష్మక్రిమి సంహారక వ్యవస్థలు, జెర్మి క్లీన్, కృత్రిమ శ్వాస పరికరాల కీలక విడిభాగాలు, వంటివి అతి తక్కువ వ్యవధిలో డి.ఆర్.డి.బి. తయారు చేయగలిగిందన్నారు. కోవిడ్ నియంత్రణ లక్ష్యంగా వైద్య సదుపాయాలను బలోపేతం చేయడానికి డిజిల్, పాట్నా, ముజఫర్ పూర్ ప్రాంతాల్లో మూడు కోవిడ్ ఆసుపత్రులను డి.ఆర్.డి.బి. ఏర్పాటు చేసిందన్నారు. దీనికి తోడు, కోవిడ్-19 స్క్రీనింగ్ పరీక్షలు, పరిశోధనా కార్యకలాపాలను వేగవంతం చేసేందుకు పలుచోట్ల సంచార వైరాలజీ పరిశోధన, వ్యాధినిర్ధారణ లేబరేటరీలను తమ ఏర్పాటు చేసినట్లు తెలిపారు.

రక్షణ రంగపు సాంకేతిక పరిజ్ఞానంలో సవాళ్లను ఎదుర్కొనేందుకు వీలుగా తన క్షేత్ర సామర్థ్యాన్ని బలోపేతం చేసేందుకు డి.ఆర్.డి.బి. అనేక చర్యలు తీసుకుందన్నారు. అత్యుత్తమమైన రక్షణ సాంకేతిక పరిజ్ఞానాలను అతి తక్కువ వ్యవధిలో రూపొందించేలా డి.ఆర్.డి.బి. తన కృషిని కొనసాగిస్తుందన్నారు. వివిధ నిర్దేశిత లక్ష్యాల సాధనకోసం సాయుధ బలగాలతో సమన్వయంగా పనిచేసిన డి.ఆర్.డి.బి. శాస్త్రవేత్తలను, ఇతర సిబ్బందిని ఆయన అభినందించారు. డి.ఆర్.డి.బి. చేపట్టిన ప్రధాన పతాక కార్యక్రమాలను ఆయన వివరించారు. శబ్దవేగాన్ని మించి దూసుకుపోయే క్రయిజ్ క్షిపణి, అధునాతన మధ్యతరహా యుద్ధ విమానం, కొత్త తరం ప్రధాన యుద్ధ ట్యాంకు, మానవ రహిత యుద్ధ వాహనం తదితరాలను ఆయన ఈ సందర్భంగా ప్రస్తావించారు. సైబర్ భద్రత, అంతరిక్షం, కృత్రిమ మేధస్సు వంటి రేపటి తరం అవసరాలకు తగినట్టుగా పనిచేయడంపై దృష్టిని కేంద్రీకరించాలని ఆయన శాస్త్రవేత్తలకు పిలుపునిచ్చారు. రక్షణ తయారీ రంగంలో పలు అభివృద్ధి కార్యకలాపాలకు డి.ఆర్.డి.బి. సామర్థ్యం ఉత్పేరకంగా దోహదపడిందన్నారు. రక్షణ రంగంలో భారతదేశం స్వావలంబనే లక్ష్యంగా భవిష్యత్తుకు అవసరమైన అధునాతన సాంకేతిక పరిజ్ఞానాలను అభివృద్ధి చేయాలంటే విద్యా సంస్థలు, పరిశోధనా అభివృద్ధి సంస్థలు, పరిశ్రమలు కలసికట్టుగా పనిచేయాలన్నారు. డి.ఆర్.డి.బి. రూపొందిస్తున్న ఉత్పాదనలకు అవసరమైన విడి భాగాలను చిన్న, మధ్యతరహా సంస్థలు (ఎస్.ఎం.ఇ.లు), సూక్ష్మ చిన్న మధ్యతరహా సంస్థలు (ఎం.ఎస్.ఎం.ఇ.లు) సరఫరా చేస్తున్నాయని, వాటన్నింటికీ ఇప్పుడు కొత్త విజయాల్లో భాగస్వామ్యం లభించినట్లనని చైర్మన్ అన్నారు. స్టార్టప్ కంపెనీలకోసం “కలలు కనే సాహసం” పేరిట ఒక పోటీని డి.ఆర్.డి.బి. నిర్వహించిందని, దీనికి ఎంతో ప్రోత్సాహకరమైన ప్రతిస్పందన లభించిందని అన్నారు. మన సైనిక బలగాలకోసం సృజనాత్మక ఉత్పాదనలను రూపొందించేందుకు ప్రతి ఏడాది కనీసం 30 స్టార్టప్ కంపెనీలకు మద్దతు ఇవ్వాలి ఉంటుందని అన్నారు.

వివిధ అధ్యయన సంస్థలతో దీర్ఘ కాల సంబంధాలను బలోపేతం చేసుకునేందుకు, దేశంలో అందుబాటులో ఉన్న విద్యా సంస్థల నైపుణ్యాన్ని సానుకూలంగా వినియోగించుకునేందుకు డి.ఆర్.డి.బి. కృషి చేయాలన్నారు. సమస్య సత్వర పరిష్కారం లక్ష్యంగా జరిపే పరిశోధనపై డి.ఆర్.డి.బి. దృష్టిని కేంద్రీకరించవలసి ఉంటుందన్నారు. రక్షణ పరిశోధనా అభివృద్ధి రంగంలో తగిన కృషి జరిగేలా పరిశ్రమలకు తగిన మద్దతు ఇచ్చేందుకు, యువతకు సాధికారత కల్పించేందుకు డి.ఆర్.డి.బి. కృషి చేస్తుందని చెప్పారు. కాంట్రాక్ట్ సంస్థ రిజిస్ట్రేషన్ ప్రక్రియను సరళతరం చేస్తూ, ఆన్ లైన్ ద్వారా పారిశ్రామిక భాగస్వామ్య సంస్థను రిజిస్టర్ చేసుకునేందుకు రూపొందించిన నూతన వ్యవస్థను కూడా డి.ఆర్.డి.బి. చైర్మన్ ఆవిష్కరించారు. “ఉపగ్రహాల వినియోగం ద్వారా కమ్యూనికేషన్ టెక్నాలజీ పరిజ్ఞానాల రూపకల్పన అంశాల” పై తయారు చేసిన డి.ఆర్.డి.బి. మోనోగ్రాఫ్ ను విడుదల చేశారు. పర్యావరణ పరిరక్షణపై నిబంధనావళిని, డి.ఆర్.డి.బి.లో కాలం చెల్లిన రసాయనాల, వాయువుల సమస్య పరిష్కారానికి రూపొందించిన మార్గదర్శక సూత్రాలను కూడా డి.ఆర్.డి.బి. చైర్మన్ ఆవిష్కరించారు.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1685563>

63वां स्थापना दिवस: रक्षा मंत्री राजनाथ ने कहा- डीआरडीओ की उपलब्धियों पर देश को गर्व

रक्षा मंत्री राजनाथ सिंह ने रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) के 63वें स्थापना दिवस पर शुभकामनाएं दी हैं। उन्होंने कहा है कि आत्मनिर्भर भारत के निर्माण में डीआरडीओ की तकनीकी उन्नति और उपलब्धियों पर देश को गर्व है।

By Bhupendra Singh

नई दिल्ली: रक्षा मंत्री राजनाथ सिंह ने रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) के 63वें स्थापना दिवस पर शुभकामनाएं दी हैं। उन्होंने कहा है कि आत्मनिर्भर भारत के निर्माण में डीआरडीओ की तकनीकी उन्नति और उपलब्धियों पर देश को गर्व है।

रक्षा मंत्री ने कहा- डीआरडीओ की उपलब्धियां असाधारण हैं

रक्षा मंत्री ने ट्वीट किया, डीआरडीओ के स्थापना दिवस पर मैं संगठन की पूरी टीम को शुभकामनाएं देता हूं। उनकी उपलब्धियां असाधारण हैं। 2021 तथा आने वाले वर्षों में इसकी और सफलता की कामना करता हूं।

डीआरडीओ ने देश को आत्मनिर्भर बनाने का अपना संकल्प दोहराया

इस अवसर पर डीआरडीओ ने आधुनिक स्वदेशी प्रौद्योगिकी और प्रणालियों के जरिये देश को आत्मनिर्भर बनाने का अपना संकल्प दोहराया। इसने ट्वीट किया कि अनुसंधान, विकास और रचनाशीलता की हमारी यात्रा इसी रफ्तार से जारी रहेगी।

डीआरडीओ का उद्देश्य आधुनिक रक्षा प्रौद्योगिकी के जरिये देश को सशक्त बनाना है

उल्लेखनीय है कि डीआरडीओ रक्षा मंत्रालय के तहत अनुसंधान और विकास शाखा है। इसका उद्देश्य आधुनिक रक्षा प्रौद्योगिकी के जरिये देश को सशक्त बनाना है। 1958 में एक छोटे से संगठन के रूप में इसने अपना काम शुरू किया था।

राजनाथ का चीन को सख्त संदेश

केंद्रीय रक्षा मंत्री राजनाथ सिंह ने चीन को एक बार फिर सख्त संदेश दिया है। उन्होंने कहा कि हम विस्तारवादी एजेंडे का मुंहतोड़ जवाब देंगे। राजनाथ सिंह ने कहा कि भारत बाहरी खतरों से निपटने के लिए पूरी तरह से सक्षम है और जो कोई भी हमारी सुरक्षा के लिए खतरा बनेगा उसे किसी भी किमत पर बखशा नहीं जाएगा।

<https://m.jagran.com/news/national-63rd-foundation-day-defence-minister-rajnath-said-country-is-proud-of-achievements-of-drdo-21226827.html>



डीआरडीओ ने देश को आत्मनिर्भर बनाने का अपना संकल्प दोहराया।

डीआरडीओ प्रमुख ने वैज्ञानिकों से साइबर सुरक्षा, अंतरिक्ष, कृत्रिम बुद्धिमत्ता पर फोकस करने कहा

नयी दिल्ली: एक जनवरी (भाषा) रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) के प्रमुख जी सतीश रेड्डी ने शुक्रवार को कहा कि इसमें काम कर रहे वैज्ञानिकों को साइबर सुरक्षा, अंतरिक्ष और कृत्रिम बुद्धिमत्ता के क्षेत्रों में सशस्त्र बलों की अगली पीढ़ी की जरूरतों पर ध्यान केंद्रित करना होगा। डीआरडीओ का 60 वां स्थापना दिवस मनाने के लिए आयोजित एक कार्यक्रम में अपने संबोधन में रेड्डी ने कहा कि अकादमिक संस्थान, अनुसंधान एवं विकास (आर एंड डी) संगठन तथा उद्योग को अत्याधुनिक तथा भविष्योन्मुखी प्रौद्योगिकी पर साथ मिल कर काम करने की जरूरत है ताकि रक्षा क्षेत्र में भारत को आत्मनिर्भर बनाया जा सके।

रक्षा मंत्रालय द्वारा जारी एक प्रेस विज्ञप्ति में कहा गया है, “अपने संबोधन में, उन्होंने (रेड्डी ने) डीआरडीओ वैज्ञानिकों से अगली पीढ़ी की जरूरतों पर ध्यान केंद्रित करने को कहा, जिनमें साइबर सुरक्षा, अंतरिक्ष और कृत्रिम बुद्धिमत्ता शामिल हैं।” विज्ञप्ति के मुताबिक, रेड्डी ने इस बात का जिक्र किया कि कई सारे छोटे एवं मध्यम उद्यमों (एसएमई) और सूक्ष्म, लघु एवं मध्यम उद्यमों (एमएसएमई) को डीआरडीओ द्वारा पुष्पित पल्लवित किया जा रहा है क्योंकि ये डीआरडीओ की परियोजनाओं के लिए छोटे पुर्जों की आपूर्ति करते हैं।

उन्होंने कहा कि भारतीय सशस्त्र बलों के लिए नवोन्मेषी उत्पाद विकसित करने को लेकर हर साल कम से कम 30 स्टार्ट-अप को सहायता दी जानी चाहिए। रेड्डी ने डीआरडीओ के 2021 के लिए ‘निर्यात’ को मुख्य विषय (थीम) बताया और इस बात का जिक्र किया कि डीआरडीओ की प्रौद्योगिकी पर आधारित कई उत्पादों को रक्षा सार्वजनिक क्षेत्र इकाइयों तथा निजी कंपनियों द्वारा निर्यात किया गया है। उन्होंने कोविड-19 महामारी के दौरान डीआरडीओ द्वारा निभाई गई भूमिका का जिक्र करते हुए कहा कि इसकी 40 प्रयोगशालाओं ने वायरस से लड़ने के लिए युद्ध स्तर पर 100 से अधिक उत्पाद विकसित किए।

<https://navbharattimes.indiatimes.com/india/drdo-chief-asks-scientists-to-focus-on-cybersecurity-space-artificial-intelligence/articleshow/80063208.cms>

DRDO Chief called upon scientists to focus on next-gen needs

“The immense potential available in DRDO has been a catalyst for the development of industries in the defence manufacturing sector,” said G Satheesh Reddy

New Delhi: The Defence Research and Development Organisation (DRDO) Chief G Satheesh Reddy on Friday asked scientists to focus on next-generation needs including cyber security, space and artificial intelligence.

“The immense potential available in DRDO has been a catalyst for the development of industries in the defence manufacturing sector,” the DRDO Chief said observing the 63rd Foundation Day of its establishment.

Reddy also met Defence Minister Rajnath Singh and presented him a model of Akash Missile System, which is recently cleared for export.

While addressing the scientists, Reddy said that the academic institutes, research and development organisations and industry need to work together on the advanced and futuristic technologies to make India self-reliant in the defence sector.

He mentioned that a number of SMEs and MSMEs are supplying small components to subsystems for all DRDO projects and have been nurtured by DRDO.

“Now they have become partners in all new developments,” said the DRDO adding that that the institution conducts a competition dare to dream for startups and very enthusiastic response have been received.

He further added that at least 30 startups should be supported every year to develop innovative products for our forces. He said that DRDO should make efforts towards strengthening long-term ties with the academia and aim to leverage the academic expertise available in the country and increase the synergy with them.

“DRDO should concentrate on applied research and translational research and then make prototypes from the applied research,” Reddy said. He further said, that the industry should be in a position to adopt these technologies and have necessary infrastructure, and scale these up to market with sustained quality.

Chairman DRDO also launched an Online Industry Partner Registration Module to simplify the process of vendor registration.

DRDO was established in 1958 with just 10 laboratories to enhance the research work in Defence sector and was tasked with designing and developing cutting edge defence technologies for Indian Armed Forces.

Today, DRDO is working in multiple cutting edge military technology areas, which include aeronautics, armaments, combat vehicles, electronics, instrumentation, engineering systems, missiles, materials, naval systems, advanced computing, simulation, cyber, life sciences and other technologies for defence.

Reddy also said that in 2020, DRDO achieved many milestones such as maiden landing of LCA Navy onboard INS Vikramaditya, demonstration of Hypersonic Technology Demonstration Vehicle, AQuantum Key Distribution and QRNG developments in area of Quantum Technology, Laser Guided Anti Tank Guided Missile, Supersonic Missile Assisted Release of



DRDO Chief G Satheesh Reddy presenting a model of Akash Missile System to Defence Minister Rajnath Singh. - Photo: Twitter

Torpedo, Anti Radiation Missile, enhanced version of PINAKA Rocket System, Quick Reaction Surface to Air Missile (QRSAM), Maiden launch of MRSAM, 5.56 x 30 mm Joint Venture Protective Carbine (JVPC) and many other milestones.

He also highlighted the contributions of DRDO during Covid pandemic and said that nearly 40 DRDO laboratories developed more than 50 technologies and over 100 products on war footing to develop products and technologies for combating the deadly disease in India.

<https://telanganatoday.com/drdo-chief-called-upon-scientists-to-focus-on-next-gen-needs>

ThePrint

Sat, 02 Jan 2021

DRDO Chairman asks scientists to focus on next-generation needs like AI, cybersecurity

In his speech on the 60th foundation day of the DRDO, Chairman Reddy emphasised on the need for futuristic technologies to make India self-reliant in the defence sector

New Delhi: The scientists working at the Defence Research and Development Organisation (DRDO) need to focus on the next generation needs of the armed forces in cyber security, space and artificial intelligence, its Chairman G Satheesh Reddy said on Friday.

In his speech at an event to mark the 60th foundation day of the DRDO, Reddy said academic institutes, research and development (R&D) organisations and the industry need to work together on advanced and futuristic technologies to make India self-reliant in the defence sector.

A press statement issued by the defence ministry said, “In his speech, he (Reddy) called upon DRDO scientists to focus on next generation needs, including cyber security, space and artificial intelligence.”

According to the statement, Reddy mentioned that “a number of SMEs and MSMEs (micro, small and medium enterprises)” are being nurtured by the DRDO as these are supplying small components to subsystems for its projects.

He added that at least 30 startups should be supported every year to develop innovative products for the Indian armed forces.

Reddy declared “export” as the theme of DRDO for 2021 and mentioned that many products based on the DRDO’s technologies have already been exported by the defence public sector units (DPSUs) and private companies.

He also highlighted the role of the DRDO during the COVID-19 pandemic, stating that its 40 laboratories developed over 100 products on a war footing to combat the virus.

<https://theprint.in/defence/drdo-chairman-asks-scientists-to-focus-on-next-generation-needs-like-ai-cybersecurity/578042/>



File photo of DRDO Chairman - G Satheesh Reddy | Twitter @DRDO_India

DRDO Scientist explains Why Akash missile beats BrahMos & All others as India's most sought-after export weapon

Developed by DRDO, the Akash missile system has a range of 25 km and is capable of targetting fighter jets, cruise missiles, drones, and other aerial assets. The missile was inducted in 2014 in Indian Air Force and in 2015 in the Indian Army

By Smriti Chaudhary

The biggest advantage of India's home-grown Akash missile system is that it can work at "all places" unlike other surface-to-air missiles (SAM) that work only in particular altitudes and climates, former DRDO scientist Ravi Gupta asserted.

Achieving a major milestone for the 'Make in India' initiative, the Narendra Modi government on December 30 allowed the export of its Akash air defense system besides constituting a committee for faster approvals for the same.

Developed by the state-run Defence Research and Development Organisation (DRDO), the Akash missile system has a range of 25 km and is capable of targetting fighter jets, cruise missiles, drones, and other aerial assets. The missile was inducted in 2014 in Indian Air Force and in 2015 in the Indian Army.



Via Twitter

"After its induction in the Services, interest is shown in Akash missile by many friendly countries during International Exhibitions/Def Expo/Aero India. The Cabinet approval will facilitate Indian manufactures to participate in RFI/RFP issued by various countries," the Ministry of Defense said in a statement.

"Besides Akash, there is interest coming in other major platforms like Coastal Surveillance System, Radars and Air platforms," it added.

Media reports suggest that many friendly nations including Vietnam and United Arab Emirates (UAE) have shown interest in buying the surface to the air missile system.

The UAE possesses one of the most advanced air defense systems including the Russian Pantsir-S1 system for medium-range and American PATRIOT system batteries. It also deploys two US-made Terminal High Altitude Area Defense (THAAD) systems capable of targeting intercontinental ballistic missiles.

Citing US-based Missile Defense Advocacy Alliance, Al Arabiya English said that "the UAE possesses the most advanced missile defense assets in the Gulf region [and it is] the only country outside the United States to deploy a THAAD battery and the first Gulf Cooperation Council (GCC) country to deploy the Patriot PAC-3."

What is so special about Akash Missiles?

While Vietnam could be the first overseas customer of Akash, would the UAE be still interested in procuring the Indian missile system given that it has far advanced weaponry in its arsenal?

Former DRDO scientist Gupta told The EurAsian Times said that the kind of versatility that Akash offers is an advantage over other systems.

He explained that there is much more to exporting systems than just their capabilities. "For example, the consistency in supply lines. When India went to war in 1965, [and during] Kargil war and others, imported defense systems that were bought at exorbitant prices created difficulties for

us,” he said. “At the time of war, they all started creating problems like stopping the supply of spare parts and ammunition,” he added.

Kumar believes that India has been a major importer of arms which has proved to be a disadvantage on the battlefield. He added that countries aren’t allowed to use imported systems against the systems of the adversary if they are purchased from the same country.

“Look at what happened after Balakot. After India shot down Lockheed Martin’s F-16 fighter using their vintage Mig-21, the company was up in arms as it was a huge commercial setback for Lockheed Martin.

It is like deliberately and voluntarily twisting our arms if we keep on importing the defense systems. The whole point of purchasing a system is to defend the country in the event of a war and the country should be able to use it the way it wants.”

Asked about what makes India different as a defense exporter, Kumar said that India’s business ethics are well known around the world.

“I see a very bright future for defense exports for India. Besides low labor cost and abundance of resources, another advantage is India’s diversity in terms of climatic condition, topography, and temperatures. They cover pretty much all conditions of battle zones in the world. The battle zone conditions in India are far more diverse and stringent.”

Elaborating on Akash’s capabilities in comparison to other missile systems on the export market, Kumar noted that it has been designed from scratch. “From the very basics of missile design, the system has been developed. Not just the missile, the entire air defense system including the command control systems, software, logistics is indigenous.” This allows India to fine-tune it in a cost-effective manner according to the needs of the buyer, he added.

He said that unlike other surface-to-air missiles (SAM) that work only in particular altitudes and climates, Akash’s biggest advantage is that it can work at “all places.” Citing an example, he said that if Arjun tanks need to be exported, they have been tested in the Thar desert as well as the high altitude cold climate.

“Every country that has designed such surface to air missiles systems, they have designed it according to their requirements and the topography and climatic conditions of their own country.”

The export version of the short-range, surface-to-air Akash Missiles with 96% indigenization will be different from the system currently in service with the Indian armed forces, Defense Minister Rajnath Singh announced on Wednesday.

Kumar concluded with four points that favor Akash and other export-worthy systems from India in comparison to their competitors.

- The systems are developed for diverse conditions that can withstand extreme conditions anywhere in the world which makes them “most reliable and sturdy.”
- Since the system is fully indigenous, India has the capability to fine-tune it to any of the buyer’s requirements in a cost-effective manner with a high degree of effectiveness against the adversary.
- India is generally considered as a reliable partner and a seller with a high degree of business ethics and commitment.
- India doesn’t try to interfere in other country’s internal affairs, which many other countries do when they sell their defense systems. “There are so many countries who sell their system with riders. We don’t put any unethical riders so long you aren’t attacking me, you are free to use the system as per your needs.”

“These things are “very strongly” in favor of Indian defense exports,” he said.

<https://eurasianimes.com/drdo-scientist-explains-why-akash-missile-beats-brahmos-all-others-as-indias-most-sought-after-export-weapon/>

Bharat Dynamics all set for exporting Akash missiles

'Company is confident of meeting the export demand'

Bharat Dynamics Limited (BDL), manufacturer of Akash Missile, is all geared to take up export order with the Union Cabinet clearing the proposal.

The Akash weapon system, designed and developed by DRDO with 96% indigenous content, is being manufactured by BDL at its Hyderabad unit with a large number of supply chain partners, which include public sector units, small and medium scale enterprises and the private industry.

The Akash missile has the capability to engage aerial threats up to the maximum range of 25 km and up to an altitude of 18 km operating at a speed range of 1.8 to 2.5 Mach. The missile has been successfully test fired on several occasions and meets the global standard of missiles of its category.

BDL is already supplying torpedoes to a foreign country and has been promoting the product at various forums, including national and international exhibitions considering the demand and export potential of Akash missile. The missile being offered for exports will be of a different version, said an official press release.

These missiles are already in the inventory of the Indian Army and Indian Air Force. "The company has received export leads Akash weapon system. Now, with the export clearance accorded by the Government of India, BDL is set to expand its customer base in the international market. The company is confident of meeting the export demand in addition to meeting requirements of the Indian Armed Forces, as BDL has adequate established production facilities," said CMD Commodore Siddharth Mishra (Retd), according to a release.

<https://www.thehindu.com/news/cities/Hyderabad/bharat-dynamics-all-set-for-exporting-akash-missiles/article33475905.ece>

DRDO boost to mushroom farming for income generation in northeast

By Kangkan Kalita

Guwahati: Defence Research Laboratory (DRL), under Defence Research and Development Organisation (DRDO), has identified mushroom farming technology as a potential source of income generation for unemployed people in the northeast.

DRDO experts said the northeast contributes only about three per cent of the mushroom production in the country. Mushroom farming is a low-cost technology requiring little inputs in terms of investment but generates maximum output in terms of profitability.

A task group comprising scientist Ashok Naglot, along with officials Vijay Pal, Nipu Jyoti Kalita and Balram Das of DRL Tezpur has conducted a three-day skill development programme on mushroom farming and spawn production technology this week with the aim to spread awareness about the technology and make people self-reliant to boost the economy of the region. In the training session, participants from Arunachal Pradesh, Meghalaya and Assam were imparted training on oyster mushroom cultivation technology and tutored on ways to design low-cost mushroom huts and step up production.

“The introduction of spawn production technology in the course was a major breakthrough because mushroom farming technology can’t be popularised among the growers until and unless quality and continuous supply of mushroom spawn or seeds is maintained in the region. This is at present lacking in the northeastern region,” Naglot, the coordinator of the programme, told TOI.

Sophisticated labs are required in order to produce mushroom spawns from mushroom mycelium under controlled laboratory conditions. Mushroom growers in the northeast are highly dependent on mushroom seeds or spawns procured from outside northeast, especially West Bengal. However, this, at times, has resulted in a lack of continuity of the spawn supply and quality is also compromised, Naglot said.

“Apart from rice and tea, northeast can contribute big in the economy by doing mushroom farming and adopting the technology as a livelihood source,” he added.

Dr Sanjai K Dwivedi, director of DRL, Tezpur, recommended the participants to adopt mushroom farming in groups in order to produce substantial amounts of mushroom to attract consumers and for better marketing.

As spawn production technology requires technical skill and equipment, Dwivedi announced that potential participants can use DRL, Tezpur and DRL research and development centre, Salari (Arunachal Pradesh) as incubation centres for the purpose for at least one year.

<https://timesofindia.indiatimes.com/city/guwahati/drdo-boost-to-mushroom-farming-for-income-generation-in-northeast/articleshow/80075820.cms>

The Assam Tribune

Sun, 03 Jan 2021

Training imparted on mushroom farming

Tezpur: The mushroom task group comprising Ashok Naglot, Sc E, Vijay Pal and Balram Das, ALS-II of Defence Research Laboratory, DRDO, Tezpur, conducted a three-day skill development programme on mushroom farming and spawn production technology with the aim of grooming youths, women and young entrepreneurs of North East India in identified technologies so that they become self-reliant and boost the economy of the region.

DRL, DRDO has identified mushroom farming technology as a potential source of income generation for unemployed youths and women of this region because it is a low-cost technology requiring little inputs in terms of investment, but is capable of giving maximum output in terms of profitability.

The introduction of spawn production technology in the course was another breakthrough because mushroom farming technology cannot be popularised among the growers until and unless quality and continuous supply of mushroom spawn/seeds is maintained, which is at present lacking in the region.

A total number of 30 participants from three states, namely Arunachal Pradesh, Meghalaya and Assam were registered for the training programme. Lectures were delivered on different topics like health benefits and economic aspects of mushroom farming, oyster mushroom cultivation technology and ways to increase production, designing of low-cost mushroom hut and production per square feet, how to maintain continuous production of mushroom, post-harvest management strategies, infrastructure required for developing spawn producing unit, steps involved in spawn production technology and marketing strategies.

Cultivation technology and spawn production technology were also demonstrated practically by involving the participants in situ.

Dr Sanjai K Dwivedi, Director, urged the participants to adopt mushroom farming in groups in order to produce substantial amount of the crop and to attract consumers, besides for ensuring better marketing.

Similarly, he emphasised that to maintain the chain of mushroom seeds/spawn in the region, a few young educated youths should work in groups to produce spawn. As spawn production technology requires technical skill and equipments, the Director of DRL announced that potential participants can use DRL, Tezpur and DRL R&D Centre, Salari (Arunachal Pradesh) as incubation centre for atleast one year.

This initiative will help the unemployed youths/women/young entrepreneurs to develop their skills in the field and subsequently become capable enough to create own infrastructure in the near future. The initiative was lauded by all the participants who expressed their willingness to use the facility. The coordinator of the programme Ashok Naglot, Scientist 'E' emphasised on better coordination among the growers and suggested that cooperative type system should be followed for better prospects.

<http://www.assamtribune.com/scripts/detailsnew.asp?id=jan0321/state055>

Defence News

Defence Strategic: National/International

Business Standard

Mon, 04 Jan 2021

Gen Rawat reviews India's military readiness for 2nd day in AP border areas

Chief of Defence Staff Gen Bipin Rawat took stock of India's security preparedness in several forward bases near the Line of Actual Control in Arunachal Pradesh on the second day of his visit

Chief of Defence Staff Gen Bipin Rawat on Sunday took stock of India's security preparedness in several forward bases near the Line of Actual Control in Arunachal Pradesh on the second day of his visit to the frontier state amid the nearly eight-month-long Sino-India standoff in eastern Ladakh.

Gen Rawat interacted with personnel of the Army and Indo-Tibetan Border Police (ITBP) deployed in the forward most air maintained post along Subansiri valley.

"The CDS said that he was satisfied by the high morale and motivation of all ranks who will ensure certain victory if challenged or given the opportunity," an Army official quoted Gen Rawat as saying.

"He complimented soldiers for adopting innovative measures for surveillance through locally developed technology and the defence preparedness to face any challenge," he said.

Sources said Gen Rawat reviewed the overall preparedness of the armed forces in key forward bases and asked them to remain vigilant.

On Saturday, the Chief of Defence Staff carried out an aerial recce of certain areas and visited several air bases in forward areas.



Chief of Defence Staff General Bipin Rawat

His visit to assess the security scenario in the region came in the midst of the nearly eight-month-long military standoff between Indian and Chinese troops in eastern Ladakh.

The Army and the Indian Air Force have been maintaining a high state of operational readiness along the nearly 3,500-km Line of Actual Control (LAC) with China in view of the eastern Ladakh standoff.

Nearly 50,000 troops of the Indian Army are deployed in various mountainous locations in eastern Ladakh as multiple rounds of talks between the two sides have not yielded concrete outcome to resolve the face-off that began in early May.

China has also deployed an equal number of troops, according to officials.

The eighth and last round of military talks had taken place on November 6 during which both sides broadly discussed disengagement of troops from specific friction points.

Gen Rawat arrived in Dinjan air force station in Assam's Chabua on Friday afternoon and travelled to Arunachal Pradesh on Saturday on a two-day visit.

His visit to Arunachal Pradesh coincided with his completion of one year as India's first CDS, a post which was created to bring in convergence in functioning of the Army, the Navy and the Indian Air Force in dealing with national security challenges.

A key mandate of the CDS was also to facilitate restructuring of military commands for optimal utilisation of resources by bringing about jointness in operations, including through establishment of theatre commands.

In the last one year, Gen Rawat along with the top brass of the three services carried out ground work to establish an air defence command and a Peninsula command initially. The IAF will helm the air defence command and all-long range missiles as well as air defence assets will come under it.

The CDS has been part of the top military brass framing strategies to enhance India's military prowess in view of the eastern Ladakh standoff.

(Only the headline and picture of this report may have been reworked by the Business Standard staff; the rest of the content is auto-generated from a syndicated feed.)

https://www.business-standard.com/article/current-affairs/gen-rawat-reviews-india-s-military-readiness-for-2nd-day-in-ap-border-areas-121010300610_1.html



Sun, 03 Jan 2021

Nothing can deter Indian forces: CDS Rawat at LAC

Complimenting the soldiers for their operational readiness, Rawat said that only Indian soldiers could remain vigilant under the challenging conditions and they were willing to go beyond the call of duty to safeguard the country's farthest frontiers

New Delhi: The Chief of Defence Staff, General Bipin Rawat, visited on Saturday air bases and interacted with frontline soldiers in forward areas near the Line of Actual Control in Arunachal Pradesh amid a border row with China in eastern Ladakh, officials said.

“Nothing can deter the Indian armed forces from remaining steadfast in their call of duty,” an official statement quoted Rawat as saying. While the current border row is confined to the Ladakh theatre, the Indian military is on high alert to deal with any misadventure by the Chinese forces all along the border --- stretching from Ladakh in the north to Arunachal Pradesh in the east.

Rawat completed one year as India's first CDS on December 31. As CDS, Rawat is the permanent Chairman of the chiefs of staff committee (COSC), heads the department of military affairs, and is the single point military adviser to the defence minister.

The CDS also interacted with personnel from the army, the Indo-Tibetan Border Police and the Special Frontier Force in Dibang Valley and Lohit Sector of Arunachal Pradesh, the statement said.

Complimenting the soldiers for their operational readiness, Rawat said that only Indian soldiers could remain vigilant under the challenging conditions and they were willing to go beyond the call of duty to safeguard the country's farthest frontiers.

Rawat's visit to the eastern sector comes amid the nearly eight-month-long military standoff between Indian and Chinese troops on the Line of Actual Control (LAC), which has taken bilateral relations to an all-time low. The two sides haven't been able to agree on disengagement and de-escalation at friction points on the LAC despite several rounds of diplomatic and military talks

Earlier this week, defence minister Rajnath Singh said that talks with China on disengagement and de-escalation in the Ladakh sector did not yield any meaningful solution.

Both India and China are prepared for a long haul in the Ladakh sector and are firm about holding forward positions along the contested Line of Actual Control (LAC) through the harsh winter months.

Both sides are expected to hold the ninth round of military talks to reduce border but there is no indication of when India and China will hold the dialogue. Both countries had agreed to hold the corps commander-level dialogue at an early date during diplomatic talks on the dispute on December 18.

While India has consistently pushed for comprehensive disengagement at all flashpoints and restoration of status quo ante of early April during the military talks, the Chinese side wants the Indian Army to first pull back troops deployed on strategic heights on the southern bank of Pangong Tso.

<https://www.hindustantimes.com/india-news/nothing-can-deter-indian-forces-cds-rawat-at-lac/story-8UmlkZcWWBRNt35mIz7zNP.html>



CDS General Bipin Rawat pays tribute to fallen heroes at the Walong war memorial in Arunachal Pradesh.(Image via Twitter)

The Statesman

Mon, 04 Jan 2021

Armed forces resolutely countered adversaries along borders in 2020

But the military standoff with China at eastern Ladakh that began in April- May is perhaps the biggest challenge the Indian Army has faced in the last few decades. With China continuing with its aggressive posturing against India, the face-off is unlikely to end any time soon

New Delhi: Martyrdom by 20 soldiers while defending India's territorial integrity at the Galwan Valley in eastern Ladakh was the most shining example of the valour of the Indian armed forces in 2020 as they resolutely countered the country's adversaries on the LAC with China and the LoC with Pakistan during the year.

The year began with a momentous decision in India's defence history. The Department of Military Affairs was set up and the post of Chief of Defence Staff (CDS) created. Gen Bipin Rawat assumed office of CDS on 1 January. He was also made Principal Military Advisor to the Defence Minister on all tri-services matters.

But the military standoff with China at eastern Ladakh that began in April- May is perhaps the biggest challenge the Indian Army has faced in the last few decades. With China continuing with

its aggressive posturing against India, the face-off is unlikely to end any time soon. Top officials of all the three wings of the armed forces have gone on record to say that the forces were prepared for any misadventure by China.

India has, meanwhile, categorically told China that any attempt to unilaterally alter the status quo was unacceptable and that the Indian forces were determined to protect the country's sovereignty and territorial integrity at any cost.

To make the Indian Army future ready, budgetary constraints for capability development and meeting other requirements were removed during the year.

Eight French Rafale fighter jets were inducted into the Indian Air Force (IAF) and operationalised on 20 September, sending a strong message to those who challenge India's sovereignty. With its world class capability, Rafale aircraft is a gamechanger for India's national security. Air version of supersonic BrahMos Air missile were integrated on Su-30 MKI.

The strength of the Indian Navy was further increased with the commissioning of INS Kavaratti (P31), a fully combat-ready anti-submarine warfare (ASW) stealth corvette and commissioning of warship IN LCU L57.

In line with Prime Minister Narendra Modi's vision of "Atmanirbhar Bharat", the government unveiled the Defence Acquisition Procedure 2020 which aims to give an impetus to the growing domestic industry and achieve enhanced selfreliance in defence manufacturing. Defence Offset Guidelines 2020 were promulgated to attract investments and technology through offsets to enhance capabilities in the domestic defence manufacturing sector and promote the "Make in India" initiative.

An 'Atma Nirbharta' week was celebrated in August to promote indigenous development of materials and equipment to achieve selfreliance in defence manufacturing. The foreign direct investment (FDI) limit in defence manufacturing under the automatic route was raised from 49 per cent to 74 per cent.

Women's participation in the armed forces has been increasing over the years and the government took further steps in 2020 to enhance their role. Short Service Commissioned (SSC) women officers were granted permanent commission in all ten streams of the Indian Army. Four women officers were appointed onboard Indian Navy ships.

Border Roads Organisation (BRO) continued with works of strategic importance like construction of major bridges, roads and tunnels. The world's longest Highway tunnel — Atal Tunnel — built by BRO was dedicated to the nation by Prime Minister Narendra Modi on 3 October. The 80- km long road link from Dharchula (Uttarakhand) to Lipulekh (China Border) was inaugurated on 20 May. About 45 bridges of strategic importance in sensitive areas close to western, northern and north eastern borders across seven states and union territories were opened on 12 October.

The armed forces played a pivotal role in mitigating the sufferings of the people in the face of Coronavirus. They meticulously undertook operations to rescue stranded Indians from COVID-19 affected countries, such as China, Iran, Italy and Malaysia and to provide relief materials to all across the country. Hospitals of the armed forces and medical facilities have been dedicated to treat COVID-19 patients.

<https://www.thestatesman.com/india/armed-forces-resolutely-counteradversaries-along-borders-in-2020-1502944263.html>



General Bipin Rawat (Photo: SNS)

Budgeting for India's defence

- *With the Indian economy currently in recession, the question is, how do we plan and budget for the China challenge—from the borders to cyberspace?*

Budget 2021-22 could see an increased allocation for defence, given the need to factor in the threat from China. The agreements which India thought were enough to stabilize the border with China while it focused on growing the economy have not worked.

The year 2020-21 saw India scouring global markets for high-altitude clothing and light tanks that could be deployed in mountainous terrain against the backdrop of the Ladakh standoff. Did India underestimate the threat from China? India's defence budget as a percentage of central government expenditure had been decreasing in the past decade.

With the Indian economy currently in recession, the question is, how do we plan and budget for the China challenge—from the borders to cyberspace?

That's the question our panel will be debating tonight at 7pm in the fourth of Mint's Road to Recovery live online discussions (see box for details).

Over the past three weeks, Mint's Road to Recovery series of online debates have examined issues such as the challenge of funding and distributing the covid-19 vaccine, whether the government's Atmanirbhar Bharat scheme is any different from import substitution and whether the past 10 months of living through a pandemic has worsened inequality and what specific budget interventions can address this.

Curated by Mint's editors and backed by a strong line-up of reports, editorials, commentaries and podcasts, the Road to Recovery series will run till February, not only providing insights for the proficient but also clarity for novices wanting to better understand the intersection of policy, politics and economics.

This week's topic is: "Countering the China challenge: from the borders to cyberspace."

Leading the conversation are P.S. Raghavan, a former ambassador to Russia who was till a few days ago the chairman of India's National Security Advisory Board, a body on security and strategic issues that provides inputs to the government; Laxman Kumar Behera, associate professor at the Special Centre for National Security Studies at Jawaharlal Nehru University; G. Mohan Kumar, a former defence secretary (2015-17); Rajeshwari Rajagopalan, a distinguished fellow and head of Nuclear and Space Policy Initiative at Observer Research Foundation think tank; and Lt. General S.L. Narasimhan, a former Indian military attaché in Beijing and currently director-general, Centre for Contemporary China Studies, a government think tank. Mitali Mukherjee of Observer Research Foundation will moderate the session.

<https://www.livemint.com/budget/news/budgeting-for-india-s-defence-11609719241824.html>



A file photo of Indian Army tanks. Photo: AP

Major reshuffle in Army, Lt Gen Shantanu Dayal to take charge as Deputy Chief of Staff

Lt Gen Shantanu Dayal has taken charge as the new DCOAS assuming the position from January 1, 2021

New Delhi: Indian Army has undergone a major reshuffle at the top within the Army Headquarters and at the various other formations including the Corps Commanders, administrative and training institutions witnessing the change of guard. A new Deputy Chief of Army Staff (DCOAS) will take charge soon.

Lt Gen Shantanu Dayal has been named the new DCOAS. Lt Gen Dayal is the Corps Commander of the Tejpur based 4 Corps. He will take the place of Lt Gen SS Hasabnis who superannuated on December 31 as soon as his replacement arrives.

The other significant change is in the newly-created Department of Military Affairs (DMA) with Chief of Defence Staff as its first Secretary. Lt Gen Taranjit Singh, the first Army officer to join as the Additional Secretary in the Department of Military Affairs (DMA) under the Ministry of Defence, superannuated on Thursday, December 31.

He was the Deputy Chief (Operations) in the Integrated Defence Staff which has become the part of the DMA since the formation of the post of the Chief of Defence Staff. Lt Gen Anil Puri took charge in his place who till recently has been the Corps Commander of Army's 12 Corps. Lt Gen PS Minhas is taking charge as the 12 Corps Commander.

A Corps, in the hierarchy of fighting formations, is the first all arms and services combined formation which can conduct independent operations.

Indian Army has 90 Lieutenant General and has a total of Lt Gen Tumul Verma, was the General Officer Commanding (GoC) of 101 sub-area, has taken charge from Lt Gen Anil Kapoor as the new DG of the Electrical, Mechanical and Engineering (EME) Corps.

Lt Gen Rajiv Sabhawal, Signal Officer-in-Charge (SO-in-C) has retired and has been replaced by Lt Gen MM Bhurke. Lt Gen Bhurke was the Commandant of Military College of Telecommunication Engineering. The SO-in-C is the overall in-charge of all signal-related issues of the Army, Navy and Air Force.

The National Cadet Corps (NCC) has Lt Gen Tarun Kumar Aich as its new Director-General as Lt Gen Rajiv Chopra superannuated on December 31, 2020.

Commandant Staff College YVK Mohan has retired and Lt Gen MJS Kahlon will take his place. Earlier, he was the DG of Mechanised Forces.

Soon, the two Officers Training Academies at Gaya and Chennai will have the new Commandants.

The Commandant of Officers Training Academy (OTA), Gaya, Lt Gen Sunil Srivastava superannuated on December 31 and is to be replaced by Maj Gen VG Reddy on his promotion as Lt Gen on January 7, 2021. He is the Deputy Commandant of OTA Gaya currently.

Also, the Commandant of OTA, Chennai position, was lying vacant since few months, been announced as Lt Gen MK Das to take charge soon.

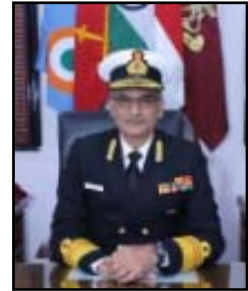
Interestingly, Major General Gautam Chauhan took charge as the first Additional Director General (Human Rights) at the Army headquarters and will report directly to the Army vice-chief. He will be the nodal officer to examine every case of human rights within the 13 lakh-strong Army.

<https://www.newindianexpress.com/nation/2021/jan/01/major-reshuffle-in-army-lt-gen-shantanu-dayal-to-takecharge-as-deputy-chief-of-staff-2244184.html>

Surgeon Vice Admiral Rajat Datta takes over as Director General Armed Forces Medical Services

New Delhi: Surgeon Vice-Admiral Rajat Datta assumed the charge of Director General, Armed Forces Medical Services on 01 Jan 2021. Prior to assuming the present appointment, the Flag Officer held the post of DGMS (Navy) and Comdt, Army Hospital (R&R) Delhi Cantt & Col Comdt.

He is an alumnus of Armed Forces Medical College, Pune and after completing his MBBS in 1982, was commissioned into AMC on 27 Dec 1982. V Admiral Rajat Datta had been holding the prestigious appointment of Comdt AFC, New Delhi. He was also Addl. DGMS (Army) New Delhi. He had been holding the appointment of MG Med, HQ Central Command, and Comdt, CH (CC) Lucknow. He is a renowned teacher and in addition to being the Professor of Cardiology is also an examiner for several Universities and Post Graduate Medical Institutions in India.



The Flag Officer is appointed as Honorary Surgeon to the President of India from 01 Feb 2020. He is a Fellow of the Society of Cardiovascular Angiography and Interventions, USA. For his dedication and devotion to the service, he was awarded VSM in 2005, SM (D) in 2014, and AVSM in 2017.

<https://www.psuconnect.in/news/Surgeon-Vice-Admiral-Rajat-Datta-takes-over-as-Director-General-Armed-Forces-Medical-Services/26131/>

GRSE delivers last landing craft utility ship to Indian Navy

The LCU ships, equipped with state-of-the-art technology, were developed in-house with 90 per cent of its parts indigenously manufactured

Kolkata: Defence PSU GRSE has delivered to the Indian Navy the last of the eight landing craft utility (LCU) ships manufactured by it, providing a major boost to the country's defence preparedness, a top company official said.

The amphibious ships, to be based in the strategic location of Andaman and Nicobar Islands -- which is close to various routes leading to the South China Sea -- "are specifically designed to undertake landing operations in most difficult beaching areas", GRSE chairman and managing director Rear Admiral (ret'd) V K Saxena said.



For representational purposes. (File | EPS)

Despite challenges owing to the COVID-19 pandemic and subsequent lockdown, the Kolkata-based Garden Reach Shipbuilders and Engineers (GRSE) has successfully delivered the last of eight LCUs manufactured for the Indian Navy, he said.

The LCU ships, equipped with state-of-the-art technology, were developed in-house with 90 per cent of its parts indigenously manufactured.

"These ships are very unique in their design and class in the world. A very specific kind of requirement was given by the Indian Navy -- speed of 15 knots, a displacement of 900- odd tonnes and a low draught for beaching in the shallowest of waters," Saxena told PTI.

Apart from troops, each ship can accommodate main battle tanks, personnel carriers and other Army vehicles, which can be launched on the beaches, he said on Thursday.

The ships are designed to accommodate 216 personnel and have two indigenous CRN 91 guns to provide artillery fire support during landing operations, he added.

<https://www.newindianexpress.com/nation/2021/jan/01/grse-delivers-last-landing-craft-utility-ship-to-indian-navy-2244014.html>

THE ECONOMIC TIMES

Sat, 02 Jan 2021

After Predator drone lease, government approves Indian Navy proposal to buy shipborne drones

Synopsis

"A proposal moved in fast track mode by the Indian Navy before the Defence Ministry, under which it will buy 10 Naval Shipborne Unmanned Aerial Systems for around Rs 1,300 crores has been cleared by the government," government sources told ANI.

After leasing two predator drones from the US, the Indian Navy is now going to urgently acquire 10 shipborne drones for enhancing its surveillance capabilities in the Indian Ocean Region, for which it has received the government approval recently.

"A proposal moved in fast track mode by the Indian Navy before the Defence Ministry, under which it will buy 10 Naval Shipborne Unmanned Aerial Systems for around Rs 1,300 crores has been cleared by the government," government sources told ANI.

The Navy will acquire these drones through an open bid under the Buy Global category and then soon deploy them on its large size warships for surveillance and reconnaissance activities.

As per the plans of the Navy, the drones would be deployed on big size warships of the force and would help them in the detection of activities of the Chinese as well as other adversaries in and around Indian territorial waters, they said.

The Indian Navy is working separately on a project to acquire Sea Guardian drones from the United States for expanding its surveillance in the country's areas of interest from Madagascar to Malacca Straits and beyond.

The Navy is also getting its existing drones upgraded as part of an upgrade programme, which was recently taken up for discussion in the Defence Ministry.

Indian Navy has inducted two American Predator drones on lease from the US to carry out surveillance in the Indian Ocean region. Capable of carrying out surveillance for more than 30 hours, the drones are operating out of Indian Navy's INS Rajali airbase.

The two Predator drones arrived in India around mid-November and entered into an operational role in the third week of November. The Indian Navy has inducted these drones under a lease agreement with the American vendor, sources added. As part of the deal, the vendor has deployed a team to guide the personnel operating the Predator drones.

<https://www.defencenews.in/article/After-Predator-drone-lease,-government-approves-Indian-Navy-proposal-to-buy-shipborne-drones-1033294>



Ramp up defence production facilities to join the top three

If India buys 12% of the world's arms exports by value, but exports just 0.17% of it, there is a huge opportunity that needs to be seized

By Gautam Mukherjee

For the Union Budget 2021 to be announced on 1 February, all commentary and advocacy is agreed that the government will have to do something extraordinary. Strong growth must be restored to the economy. This cannot just be an incremental budget citing fiscal constraints and revenue generation shortfalls. Fortunately, Finance Minister Nirmala Sitharaman has already indicated that the fiscal deficit will be allowed to slip. Estimates say it is already in the region of 7.5%.

However, this is a very unusual time. When money needs to be invested but is scarce, there are very few options. This country, like most others around the globe, will also have to undertake an unprecedented and expensive vaccination process for most of the population.

The debate is on between those who want the government to promote consumption, and those who want new money spent on productive assets that will yield a return in future.

Of course, a certain degree of welfarism is hard-wired into the Indian system with its socialist moorings. It is aimed at helping the bottom 20% of the population. This must not only continue but be enhanced in value terms. But consumption-led growth, which is not organic but pump-primed, will result in a temporary uptick at best. Will it enthrone greater investment by the private sector and lift the mood of the nation? It seems unlikely. America has followed this course, putting in billions every month straight into the general economy, while maintaining a zero-interest rate regime. This has gone on from 2008 after the housing and subprime lending crash. Still, it has only yielded a survival economy by 2020, growing at 3% on consumption alright, but with a widened gap between the 1% rich, and practically all the others. Zero interest favours those who can put it to productive use. The rest just spend their money on everyday goods and services.

In percentage terms, of all fresh monies pumped in now, some 60% needs to go into productive investments. Without this, the international rating and lending agencies will see India as a fiscally irresponsible economy going forward. The question is: what will be the most profitable investment? And the answer is defence production.

Armaments are high value items with strong embedded profits. India has exported Rs 17,000 crore worth in 2018-19 (approximately \$1.5 billion), up from just Rs 2,000 crores in 2014. The target is Rs 35,000 crore or about \$5 billion annually. The gradualism of doing this in the next five years must be fast-tracked. Can it be done in 2021 itself?

The government has announced plans to invest \$130 billion in the next five years on military production modernisation. Can this be completed by 2022 with the help of this fiscal deficit slippage?

India has purchased about \$100 billion worth of armaments over the last decade or \$10 billion per annum pro rata. It actually needs to procure perhaps twice as much to be fighting fit in a two- or even multiple-front war. It actually ends up buying much less than its wish-list because of fiscal constraints.

The latest emergency annual purchase is, in fact, upwards of \$15 billion. Buying more and more



from domestic production after recent policy changes is helping, but every part of the exercise, particularly the efficiency and turn-around time of domestic manufacture, needs to be accelerated. \$5 billion in exports achieved in short order would claw back half of the pro rata annual expenditure over the last decade. Estimates indicate India could be exporting \$15 billion worth annually within a decade. Again, can this time-line not be crunched, given some urgent revamping of facilities and policy initiatives?

Nothing else in the possibilities, including all kinds of manufacturing relocations from China, exports of other manufactured goods including electronics, automobiles, launches of foreign satellites by ISRO, commodities, software, even comes close.

And then there is the import substitution that comes from having a highly developed armaments industry. The money spent stimulates the economy but stays in-country. However, this is not a swadeshi call likely to truncate quality. Let us note that the imported content of armaments currently made in India is still at 40% as of 2018, though down from 48% in 2014. The trendline is interesting. The recent Cabinet-approved bid to export Akash Air Defence Systems with a range of 30 km has a 96% indigenisation figure. Nine countries want to import it.

Other items we could export in short order are the Brahmos missiles, the Pinaka multi-barrel rocket launchers and the Astra air to air missiles. To meet both domestic demand from the Indian armed forces and foreign countries in a competitive timeframe, India must undertake a massive modernisation, expansion, and upgradation programme. This must stand independent of the general defence budget, which is mostly consumed by establishment costs and pensions.

Besides, our overall defence budget at \$70 billion presently, is dwarfed by that of China at \$261 billion, let alone that of the US at \$732 billion. Let us note, however, that there is a demand for Indian armaments internationally, unlike for those from China. The Indo-Russian developed Brahmos missiles could be instant best-sellers if India decides to offer them to friendly governments configured to their specific requirements. This would also mean significant value addition. The secret configurations of our own missiles and other exported armaments can be safeguarded. Most arms exporting countries do likewise. But no major armaments manufacturing country can sustain the massive costs involved without exports.

India already has a number of facilities serving the Army, Navy, Air Force, logistics, ordnance and engineering requirements. These include DRDO and its 50 labs, 4 defence shipyards, 8 defence PSUs and 41 ordnance factories. In recent times, a number of private companies such as Bharat Forge, the Kalyani Group, Larsen & Toubro, the Tata Group, SSS Defence, HTNP Industries, Alpha Design Technologies, Bharat Advanced Defence Systems, SMPP Private Limited, have also entered defence manufacturing. We are developing a new Defence Corridor in Uttar Pradesh in addition to the older and more mature one in Tamil Nadu. But, as always, the private ecosystem cannot survive without orders. And presently, the orders are mostly from the Indian armed forces. Union budget 2021 needs bold strategies to move this country forward and into the reckoning for the future. If India buys 12% of the world's arms exports by value, but exports just 0.17% of it, there is a huge opportunity that needs to be seized.

Initiatives already fructified such as manufacturing our own, sometimes in joint venture, nuclear and conventional submarines, stealth frigates, patrol boats, our own aircraft carrier, the light compact aircraft (LCA), trainer aeroplanes that we have even offered to the US, the Arjun MK-1 A tanks we are inducting into the Indian Army, mobile bridges, bullet-proof vests, small arms, rifles, machine guns, carbines, armoured vehicles, transport vehicles—have all taught us many learnings. If the biggest roadblock in the past was policy, which did not want to develop an Indian armaments industry worth the name, then at present the only real drag is the pace at which we are proceeding to change the template. It takes massive investment, but so do the highways we are building at breakneck speed all over the country.

Our own security needs, our economic well-being, standing in the comity of nations, necessitates this dimension to our development. And the sooner we put urgent emphasis on it the better. We need to put massive resources behind the vision statement and policy changes to realise this crucial atmanirbhar objective.

An economic power is vulnerable without a strong military supported by its own arms industry. Even if we cannot own the entire ecosphere, because of the practical necessity of not reinventing the wheel, making most parts of the armaments we produce is a valid aspiration. Global players like Boeing and Lockheed-Martin buy a lot of the componentry for their military planes from outside, sometimes international vendors. It is a highly specialised business, and no entity can do everything in-house profitably.

India is on its way from sixth largest economy towards becoming the third largest by 2030. But renewed Chinese hostility along the LAC, constant friction with Pakistan and its terrorist infiltrators, plus internal sabotage by forces who wish to retard the economy, have made clear that defence preparedness is both good sense and good business.

<https://www.sundayguardianlive.com/opinion/ramp-defence-production-facilities-join-top-three>

INDIA
TODAY

Mon, 04 Jan 2021

Himalayan Impasse | India-China standoff

The Chinese PLA incursions in eastern Ladakh and the massive military build-up by both sides have resulted in the most explosive situation on the LAC in over 50 years

By Sandeep Unnithan

India's challenges in 2020 included not just the pandemic but also a national security threat on the borders in eastern Ladakh. A series of incursions by the Chinese People's Liberation Army (PLA) has been the biggest attempt to forcibly alter the 1,597 km Line of Actual Control (LAC) since the 1962 border war. PLA troops stepped forward to claim territory on the Depsang Plains and at three other spots, including the shores of the picturesque boomerang-shaped Pangong lake. The incursions led to a violent skirmish in the Galwan Valley on June 15 in which 20 Indian soldiers, including the commanding officer Col. Santosh Babu, were killed. An unknown number of PLA soldiers were also killed in the melee, the largest clash between the two sides since the 1967 Nathu La and Cho La skirmishes in Sikkim. A countermove in late August saw Indian Army special forces, including ethnic Tibetan fighters, occupying strategic heights south of the lake, overlooking Chinese positions. Nearly eight months later, the two armies are locked in a standoff, with close to 100,000 soldiers from both sides deployed at extreme altitudes of over 12,000 feet. At some locations, such as Rechin La which army chief General M.M. Naravane visited during a recent tour of the frontlines, troops and tanks on either side are just a few hundred metres apart.



Battle ready: Army chief Gen. Naravane (second from left) in Rechin La on a visit to the frontlines. (Photo: ANI)

What has beguiled New Delhi is that despite India sitting out of President Xi Jinping's Belt and Road initiative and protesting the China Pakistan Economic Corridor (CPEC), relations between the two countries were better than they had been in years, seemingly helped by personal summits between President Xi and Prime Minister Narendra Modi. The second summit, at Mamallapuram, was in fact held just seven months before the May incursions. One key government official believes Beijing's belligerence was as much about safeguarding Chinese interests in Pakistan-occupied Kashmir as it was about showing New Delhi that China is Asia's preeminent power. India has indicated it will accept nothing less than a restoration of the ground situation as it existed on April 2020. It has hit back with a series of economic measures aimed at restricting Beijing's access to Indian markets-from smartphone apps to Chinese telecommunication equipment. Foreign minister S. Jaishankar has called relations between India and China "significantly damaged" and

said the only way they can improve is if China pulls back its troops. Even as both sides hunker down through a brutal winter, the next year will see who blinks first.

Keynotes

- Chinese PLA makes incursions across Indian borders in Ladakh
 - May incursions happen seven months after Xi-Modi summit
 - Galwan Valley clash leaves 20 Indian soldiers dead, unknown PLA casualties in June
- <https://www.indiatoday.in/magazine/news-makers/story/20210111-himalayan-impasse-india-china-standoff-1755175-2021-01-03>



Sat, 02 Jan 2021

US' 'Black Hawk' clone Chinese 'Z-20' helicopters ready for attack missions with KD-10 missiles

By Mansij Asthana

China has hinted that its Harbin Z-20 helicopter, which is considered a clone of the US H-60/S-70 Black Hawk, will be deployed in attack missions as the latest image shows the aircraft carrying KD-10 air-to-ground missiles.

Built by the Chinese aerospace and defense company, Harbin Aircraft Industry Group (HAIG), the Z-20 is a medium-lift utility helicopter, which has been subject to scrutiny regarding its design similarities to the US-made Sikorsky UH-60 Black Hawk helicopter.

Named after the Native American war leader Black Hawk, the UH-60 Black Hawk is a four-blade, twin-engine, medium-lift utility helicopter manufactured by Sikorsky Aircraft, a unit of the US aerospace giant Lockheed Martin.



Sikorsky uh-60 Black Hawk helicopter

After a thorough evaluation, the US military selected the design of the Black Hawk in 1976. The Black Hawk's civilian variant, the Sikorsky S-70C-2, has been used by the People's Liberation Army since 1984.

The Chinese Z-20

Having first flown in 2013, the Chinese Z-20 has a maximum takeoff weight in the range of 10 tons (22,000 lb) and can operate from locations above 13,000 ft in altitude as well as from the Liaoning aircraft carrier, which was the PLA Navy's first commissioned carrier.

Since its first flight, the Z-20 has proved its mettle as a powerful helicopter. While it is often compared to the US' Black Hawk design, it is different from the US-made helicopter in certain ways.

These include their differences in the cockpit area, changes to Z-20's tail configuration, and its rotor design. While the Black Hawk has four rotors, the Z-20 has five rotors, and it now seems that the Chinese helicopter is also installed with a satellite communications array.

In addition, while the Black Hawk multirole helicopter has been in use by the US military and the armed forces of 28 other nations across the world, the Z-20 is exclusively used by China.

According to the website of American aerospace giant, Lockheed Martin, over 4,000 Black Hawk aircraft of all types are in service globally, with the US Army being the largest operator with around 2,135 H-60 aircraft in its fleet.

The picture of Harbin Z-20 carrying KD-10 air-to-ground missiles originated from a Chinese micro-blogging site called Weibo. The helicopter appears to be carrying at least eight KD-10 missiles — each of the stub-wings loaded with four missiles.

Specifically developed for the Z-10 attack helicopters, the KD-10 is a new-generation anti-tank guided missile (ATGM).

The missiles are broadly considered to be in the same class as the AGM-114 Hellfire air-to-surface missiles and make use of semi-active laser guidance while having a range of around four miles.

As compared to the KD-9 missiles which are lighter and smaller, the KD-10 missiles are heavier and bigger in size.

There is speculation that an MMW (millimeter wave) seeker is currently being developed for KD-9/KD-10, coupled with the new mast-mounted MMW radar, which is being tested on the Harbin Z-19 light reconnaissance/attack helicopter.

The missile is 1,775mm in length, with a weight of around 46kgs and an armor penetration of 1,400mm.

It's not clear if these are dummy missiles or live rounds.

<https://eurasianimes.com/us-black-hawk-clone-chinese-z-20-helicopters-ready-for-attack-missions-with-kd-10-missiles/>

Science & Technology News

THE TIMES OF INDIA

Sat, 02 Jan 2021

ISRO hints at virtual launch & satellite control in future

By Chethan Kumar

Bengaluru: ISRO Chairman K Sivan, while pointing out the various challenges encountered due to Covid-19, said that virtual launch control centre (LCC) and satellite control centre (SCC) may become the new normal, while the agency has a packed new year that will also see more reforms.

“In the future, when we look back at 2020, we’ll be reminded of trials and tribulations owing to the pandemic. Notwithstanding this, a lot of work progressed in virtual mode in design and development. Major technical issues of Gaganyaan and Chandrayaan-3 were addressed, concept of virtual LCC, SCC got evolved and implemented. In fact, this mode of work appears to be more efficient and can be the new normal,” Sivan said.



Reflecting on the past decade, he said the last 10 years were a decade of many firsts in almost all the verticals of Isro: The operationalization of GSLV with indigenous cryogenic stage and GSLV MkIII, Mars Orbiter Mission, Astrosat, NavIC constellation, heaviest high throughput satellite, and technology demonstration missions of winged body Reusable Launch Vehicle & Scramjet engine.

“When we look towards the next decade, we must be aware that globally, the sector is facing disruption due to the entry of many private players, changing all aspects, including launch vehicles and human spaceflight, which were hitherto the domain of government space agencies,” he said.

In line with global directions, Isro requires to develop heavy lift launch vehicles, semi-cryogenic stages, reusable launch vehicles, advance propulsion, next generation avionics, advance materials,

dynamic space applications and efficient integration of space based services as well as advanced space science missions, Sivan said.

“The situation is not different in our country; for the first time, we have a handful of entrepreneurs who’ve come forward to develop end-to-end launch vehicles and satellites with the intention of providing space-based services. Having taken note of this transformation, the government announced a series of initiatives to provide policy support and enable them to co-exist and achieve commercial success,” Sivan said.

He added that the Indian National Space Promotion & Authorization Center’s (IN-SPACE) interim committee is already making efforts to interface with 28 private players and processing applications, which would also put in place a seamless operating mechanism for IN-SPACE, as and when it becomes fully operational.

“It is expected very shortly,” Sivan said, adding that the commissioning of a second launch site at Kulasekarapattanam in Tamil Nadu, in near future will also give a major boost to entrepreneurs.

“With the expansion of the space sector, the work of Isro is going to increase with a major focus on innovation and development. Isro is a torch-bearer of innovation mainly due to the unique challenges with respect to the development, qualification and reliable operation of space systems in harsh space environments,” Sivan said, adding that the major projects in the pipeline are Chandrayaan-3, Aditya, Gaganyaan, among others.

<https://timesofindia.indiatimes.com/india/isro-hints-at-virtual-launch-satellite-control-in-future/articleshow/80061259.cms>



Sat, 02 Jan 2021

Reusable rockets, satellite constellation for broadband in ISRO's 10-year plan

In the short term, the space agency has to realise the first developmental flight of the Small Satellite Launch Vehicle (SSLV) operational Geo-Imaging capability, the third moon mission Chandrayaan-3, the first solar mission Aditya-L1, and the first Indian Data Relay Satellite

Chennai: Stepping into 2021, the Indian Space Research Organisation (ISRO) has chalked out its decadal plan which includes development of a heavy lift rocket, reusable satellite launch vehicle, semi-cryogenic engine, and others, said a top official.

In the short term, the space agency has to realise the first developmental flight of the Small Satellite Launch Vehicle (SSLV) operational Geo-Imaging capability, the third moon mission Chandrayaan-3, the first solar mission Aditya-L1, and the first Indian Data Relay Satellite.

"The first unmanned flight under the Gaganyaan Programme is another significant milestone to be achieved this year," ISRO Chairman K. Sivan, who is also Secretary, Department of Space, ISRO said.

In his New Year message, he said all the centres/units of ISRO have actively contributed to the formulation of the decadal plan.

Sivan said: "In this decade, the VSSC (Vikram Sarabhai Space Centre), the lead centre for space transportation systems, will carry forward its competence in launch vehicle development towards heavy lift capabilities, achieving partial & full reusability and achieving progress in scramjet engine research."

According to Sivan, the Liquid Propulsion Systems Centre (LPSC) will fructify the much-awaited high thrust semi-cryogenic propulsion capability, which is expected to boost the lifting capability of Indian rockets to Geostationary Transfer Orbit (GTO) to almost 5.5 ton while also

focusing on liquid oxygen (oxidiser)-Methane propulsion, green propulsion as well as electric propulsion.

He also said ISRO Propulsion Complex (IPRC) needs to gear up its test facilities to support the qualification of the new propulsion systems and also expand its integration facilities to realise the new semi-cryogenic and LOX/Methane engines.

"In the next decade, emphasis will be on satellite constellation for broadband communication, all electric satellite platform and high performance satellite platforms in all the application areas," Sivan said as regards the decadal plans for the U.R. Rao Satellite Centre (URSC).

He said the Space Applications Centre (SAC) will complete its indigenisation efforts for atomic clock and traveling wave tube amplifiers (TWTA).

In this decade, SAC and the National Remote Sensing Centre (NRSC) need to work towards ensuring the collection, processing and on-demand delivery of satellite data services in line with user expectations.

As regards the rocket port under the Satish Dhawan Space Centre (SDSC) scaling up of the launch infrastructure to support human spaceflight as well as new heavy lift vehicles and perhaps support and facilitate the launching of private space transportation systems in the country, Sivan said.

The Semi-Conductor Laboratory SCL will work towards creating a strong micro-electronics base in the country and enhance capabilities in Very Large Scale Integrated circuit (VLSI) domain.

"A lion's share of ISRO's technology development & advanced R&D activities is expected to be carried out for facilitating the Gaganyaan (human space mission) programme and sustaining the human spaceflight activities in the long term," Sivan added.

On its part, the Human Space Flight Centre (HSFC), in association with all other ISRO centres, is working towards the enhanced capabilities essential for the human spaceflight programme including the human rated launch vehicle, Orbital Module, rendezvous and docking, regenerative life support systems and space habitats, Sivan added.

<https://telecom.economictimes.indiatimes.com/news/reusable-rockets-satellite-constellation-for-broadband-in-isros-10-year-plan/80067423>

ScienceDaily

Fri, 01 Jan 2021

See live cells with seven times greater sensitivity using new microscopy technique

Upgrade to quantitative phase imaging can increase image clarity by expanding dynamic range
Summary:

Experts in optical physics have developed a new way to see inside living cells in greater detail using existing microscopy technology and without needing to add stains or fluorescent dyes.

Experts in optical physics have developed a new way to see inside living cells in greater detail using existing microscopy technology and without needing to add stains or fluorescent dyes.

Since individual cells are almost translucent, microscope cameras must detect extremely subtle differences in the light passing through parts of the cell. Those differences are known as the phase of the light. Camera image sensors are limited by what amount of light phase difference they can detect, referred to as dynamic range.

"To see greater detail using the same image sensor, we must expand the dynamic range so that we can detect smaller phase changes of light," said Associate Professor Takuro Ideguchi from the University of Tokyo Institute for Photon Science and Technology.

The research team developed a technique to take two exposures to measure large and small changes in light phase separately and then seamlessly connect them to create a highly detailed final image. They named their method adaptive dynamic range shift quantitative phase imaging (ADRIFT-QPI) and recently published their results in *Light: Science & Applications*.

"Our ADRIFT-QPI method needs no special laser, no special microscope or image sensors; we can use live cells, we don't need any stains or fluorescence, and there is very little chance of phototoxicity," said Ideguchi.

Phototoxicity refers to killing cells with light, which can become a problem with some other imaging techniques, such as fluorescence imaging.

Quantitative phase imaging sends a pulse of a flat sheet of light towards the cell, then measures the phase shift of the light waves after they pass through the cell. Computer analysis then reconstructs an image of the major structures inside the cell. Ideguchi and his collaborators have previously pioneered other methods to enhance quantitative phase microscopy.

Quantitative phase imaging is a powerful tool for examining individual cells because it allows researchers to make detailed measurements, like tracking the growth rate of a cell based on the shift in light waves. However, the quantitative aspect of the technique has low sensitivity because of the low saturation capacity of the image sensor, so tracking nanosized particles in and around cells is not possible with a conventional approach.

The new ADRIFT-QPI method has overcome the dynamic range limitation of quantitative phase imaging. During ADRIFT-QPI, the camera takes two exposures and produces a final image that has seven times greater sensitivity than traditional quantitative phase microscopy images.

The first exposure is produced with conventional quantitative phase imaging -- a flat sheet of light is pulsed towards the sample and the phase shifts of the light are measured after it passes through the sample. A computer image analysis program develops an image of the sample based on the first exposure then rapidly designs a sculpted wavefront of light that mirrors that image of the sample. A separate component called a wavefront shaping device then generates this "sculpture of light" with higher intensity light for stronger illumination and pulses it towards the sample for a second exposure.

If the first exposure produced an image that was a perfect representation of the sample, the custom-sculpted light waves of the second exposure would enter the sample at different phases, pass through the sample, then emerge as a flat sheet of light, causing the camera to see nothing but a dark image.

"This is the interesting thing: We kind of erase the sample's image. We want to see almost nothing. We cancel out the large structures so that we can see the smaller ones in great detail," Ideguchi explained.

In reality, the first exposure is imperfect, so the sculpted light waves emerge with subtle phase deviations.

The second exposure reveals tiny light phase differences that were "washed out" by larger differences in the first exposure. These remaining tiny light phase difference can be measured with increased sensitivity due to the stronger illumination used in the second exposure.

Additional computer analysis reconstructs a final image of the sample with an expanded dynamic range from the two measurement results. In proof-of-concept demonstrations, researchers estimate the ADRIFT-QPI produces images with seven times greater sensitivity than conventional quantitative phase imaging.

Ideguchi says that the true benefit of ADRIFT-QPI is its ability to see tiny particles in context of the whole living cell without needing any labels or stains.

"For example, small signals from nanoscale particles like viruses or particles moving around inside and outside a cell could be detected, which allows for simultaneous observation of their behavior and the cell's state," said Ideguchi.

Story Source:

[Materials](#) provided by [University of Tokyo](#). Note: Content may be edited for style and length.

Journal Reference:

1. K. Toda, M. Tamamitsu, T. Ideguchi. **Adaptive dynamic range shift (ADRIFT) quantitative phase imaging.** *Light: Science & Applications*, 2020 DOI: [10.1038/s41377-020-00435-z](https://doi.org/10.1038/s41377-020-00435-z)
<https://www.sciencedaily.com/releases/2020/12/201231195113.htm>

COVID-19 Research News



Mon, 04 Jan 2021

Vaccine approval a decisive turning point in fight against coronavirus: PM Modi

By Neetu Chandra Sharma

- *While Pune-based Serum Institute of India's Covishield is a version of the vaccine originally co-developed by AstraZeneca and the University of Oxford, the vaccine by Bharat Biotech is developed in collaboration with the ICMR*

New Delhi: Calling the Drugs Controller General of India's (DCGI) approval to the two covid-19 vaccines "a decisive turning point" in the country's fight against the pandemic, Prime Minister Narendra Modi on Sunday said the nod is a step towards Aatmanirbhar Bharat or self-reliant India.

"A decisive turning point to strengthen a spirited fight! DCGI granting approval to vaccines of @SerumInstIndia and @BharatBiotech accelerates the road to a healthier and COVID-free nation. Congratulations India. Congratulations to our hardworking scientists and innovators," the Prime Minister said in a series of tweets. "It would make every Indian proud that the two vaccines that have been given emergency use approval are made in India!," he said.

While Pune-based Serum Institute of India's Covishield is a version of the vaccine originally co-developed by AstraZeneca and the University of Oxford, the one by Bharat Biotech is developed in collaboration with the Indian Council of Medical Research (ICMR) - National Institute of Virology (NIV).

"The development of Covaxin was truly a public private partnership (PPP). The evaluation of covaxin has resulted in several unique product characteristics including long term persistence of immune responses to multiple viral proteins, as opposed to only the spike protein, and has demonstrated broad spectrum neutralizing capability with heterologous SARS-CoV2 strains, thus potentially reducing or eliminating escape mutants," said Krishna Ella, chairman and managing director, Bharat Biotech.

It has also shown to generate memory T cell responses, for its multiple epitopes, indicating longevity and a rapid antibody response to future infections. Its most critical characteristic is the demonstrated safety profile, which is significantly lower than several other vaccines with published data, he said.

"The Phase III human clinical trials of Covaxin began mid-November, targeted to be done in "26,000" volunteers across India, this is India's first and only Phase III efficacy study for a COVID-19 vaccine, and the largest phase III efficacy trial ever conducted for any vaccine in India," said Ella.

Covaxin has been evaluated in approximately 1,000 subjects in Phase I and Phase II clinical trials, with promising safety and immunogenicity results, with acceptance in international peer reviewed scientific journals, he said.

The product development and clinical trial data thus far has generated 5 publications, which have been submitted to international peer reviewed journals. Four of these have been accepted and

will be published soon. The publication of phase II trial data is undergoing the peer review process. As a part of our regulatory guidelines, all data has been submitted to the DCGI and Central Drugs Standard Control Organisation (CDSCO), said Ella.

The subject expert committee, tasked with vetting covid-19 vaccine proposals, has recommended granting emergency use authorization to Serum Institute of India's (SII's) Covishield. The panel recommended "interim efficacy analysis for Covaxin"—developed by Bharat Biotech in collaboration with the Indian Council of Medical Research (ICMR). The panel asked the Hyderabad-based drugmaker to expedite volunteer recruitment for its ongoing clinical trial.

The vaccination drive is expected to start anytime next week, according to the government and the pharma officials involved in the covid-19 vaccine manufacturing.

Union Health Minister Harsh Vardhan after the approval of vaccines said in a series of tweets "it's now time to reap the benefits of the robust supply chain infrastructure we've put in place for quick & equitable distribution of the vaccine Urge all citizens to entrust the stringent protocols followed for ensuring safety, efficacy & immunogenicity of the approved vaccines."

<https://www.livemint.com/news/india/vaccine-approval-a-turning-point-in-fight-against-coronavirus-pm-modi-11609664111968.html>

