

DRDO

NEWSLETTER



www.drdo.gov.in

A Monthly Bulletin of Defence Research and Development Organisation

AUGUST 2023

VOLUME 43

ISSUE 08

ISSN: 0971-4391

Release of 75 Technology Priority Areas for
DEFENCE RESEARCH AND DEVELOPMENT ORGANISATION
27th June 2023

Chief Guest - **General Anil Chauhan** PVSM UYSM AVSM SM VSM
Chief of Defence Staff

सूजनार्थं परिश्रमति यन्त्राणि च समर्पिताः । विज्ञानं प्रगतिं दध्नुः तत्र संस्कृतयोः स्थिताः ॥

DRDO_India | DPDRDO | dpldrdo | DRDO_India | www.drdo.gov.in





Editor-in-Chief: Dr K Nageswara Rao
Associate Editor-in-Chief: Alka Bansal
Managing Editor: Ajay Kumar

Editor: Dipti Arora
Editorial Assistance: Raj Kumar

Printing: SK Gupta
Marketing: Tapes Shina

43rd Year of Publication



Scan QR Code to access e-version
of DRDO Newsletter

LABORATORY CORRESPONDENTS

- Ahmadnagar** : Shri RA Shaikh, Vehicle Research and Development Establishment (VRDE)
- Ambernath** : Dr Ganesh S. Dhole, Naval Materials Research Laboratory (NMRL)
- Chandipur** : Shri PN Panda, Integrated Test Range (ITR)
Shri Ratnakar S, Mohapatra, Proof & Experimental Establishment (PXE)
- Bengaluru** : Shri Satpal Singh Tomar, Aeronautical Development Establishment (ADE)
Smt MR Bhuvanewari, Centre for Airborne Systems (CABS)
Smt Faheema AGJ, Centre for Artificial Intelligence & Robotics (CAIR)
Dr Josephine Nirmala M, Combat Aircraft Systems Development & Integration Centre (CASDIC)
Dr Sanchita Sil & Dr Sudhir S Kamble, Defence Bioengineering & Electromedical Laboratory (DEBEL)
Dr V Senthil, Gas Turbine Research Establishment (GTRE)
Shri Venkatesh Prabhu, Electronics & Radar Development Establishment (LRDE)
Dr Ashok Bansawal, Microwave Tube Research & Development Centre (MTRDC)
- Chandigarh** : Dr Pal Dinesh Kumar, Terminal Ballistics Research Laboratory (TBRL)
: Dr Anuja Kumari, Defence Geoinformatics Research Establishment (DGRE)
- Chennai** : Shri K Anbazhagan, Combat Vehicles Research & Development Establishment (CVRDE)
- Dehradun** : Shri Abhai Mishra, Defence Electronics Applications Laboratory (DEAL)
Shri JP Singh, Instruments Research & Development Establishment (IRDE)
- Delhi** : Shri Tapes Shina, Defence Scientific Information & Documentation Centre (DESIDOC)
Dr Dipti Prasad, Defence Institute of Physiology & Allied Sciences (DIPAS)
Shri Santosh Kumar Choudhury, Defence Institute of Psychological Research (DIPR)
Shri Navin Soni, Institute of Nuclear Medicine and Allied Sciences (INMAS)
Smt Rabita Devi, Institute for Systems Studies & Analyses (ISSA)
Shri Ashok Kumar, Scientific Analysis Group (SAG)
Dr Rupesh Kumar Choubey, Solid State Physics Laboratory (SSPL)
- Gwalior** : Dr AK Goel, Defence R&D Establishment (DRDE)
- Haldwani** : Dr Atul Grover, Defence Institute of Bio-Energy Research (DIBER)
- Hyderabad** : Shri Hemant Kumar, Advanced Systems Laboratory (ASL)
Shri ARC Murthy, Defence Electronics Research Laboratory (DLRL)
Dr Manoj Kumar Jain, Defence Metallurgical Research Laboratory (DMRL)
- Jagdarpur** : Dr Gaurav Agnihotri, SF Complex (SFC)
- Jodhpur** : Shri DK Tripathi, Defence Laboratory (DL)
- Kanpur** : Dr Mohit Katiyar, Defence Materials & Stores Research & Development Establishment (DMSRDE)
- Kochi** : Smt Letha MM, Naval Physical & Oceanographic Laboratory (NPOL)
- Leh** : Dr Dorjey Angchok, Defence Institute of High Altitude Research (DIHAR)
- Mussoorie** : Gp Capt RK Mansharamani, Institute of Technology Management (ITM)
- Mysuru** : Dr M Palmurugan, Defence Food Research Laboratory (DFRL)
- Pune** : Shri Ajay K Pandey, Armament Research and Development Establishment (ARDE)
Dr Vijay Pattar, Defence Institute of Advanced Technology (DIAT)
Dr Ganesh Shankar Dombe, High Energy Materials Research Laboratory (HEMRL)
- Tezpur** : Dr KS Nakhuru, Defence Research Laboratory (DRL)
- Visakhapatnam** : Smt Jyotsna Rani, Naval Science & Technological Laboratory (NSTL)



Contents

COVER STORY 4

EVENTS 6



HRD ACTIVITIES 15

PERSONNEL NEWS 19

VISITS 21

<https://www.drdo.gov.in/drdo/pub/newsletter/>

Please mail your feedback and suggestions at:
director.desidoc@gov.in; drdonl.desidoc@gov.in
Contact at: 011-23902403; 23902472; Fax: 011-23819151



ANUSANDHAAN CHINTAN SHIVIR TO ENCOURAGE DEFENCE R&D IN INDUSTRY AND ACADEMIA

The Defence Research and Development Organisation (DRDO) organised an 'Anusandhaan Chintan Shivir' in New Delhi on 27 June 2023, with the aim to encourage defence R&D within the industry and academia.

The Chief of Defence Staff General Anil Chauhan, was the Chief Guest at the event.

On the occasion, a list of 75 technology priority areas was released. The list identified by the DRDO is further divided into

403 technological categories, which further spread out to 1,295 current and future technology development tasks. The technology priority areas, as listed in DRDO Technology Foresight 2023, are as follows:

S. N.	Technology Area
1	Additive Manufacturing
2	Aero Structures
3	Aerodynamics
4	Aeromechanical Systems
5	Agro Technology for Military Support in High Altitude Areas
6	AI/ML Technology
7	Alternative Power Plant
8	Antennas
9	Armoured & Combat Vehicles
10	Autonomous Systems and Robotics
11	Behavioural Analysis for Soldiers
12	Bio-defence
13	Bio-remediation
14	Biomedical Engineering & Technologies
15	C4ISR
16	Camouflage Technology
17	CBRN Defence
18	Communication
19	Control Systems
20	Counter Swarm Technology
21	Cyber, Information, & Communication Security
22	Decoys

S. N.	Technology Area
23	Detonics & Mechanisms
24	Diesel Engine
25	Directed Energy
26	Electric Power Technology
27	Electro-optics
28	Electronic Devices
29	Electronic Warfare
30	EM Rail Gun
31	Embedded Systems
32	Energy
33	Environment Protection
34	Environmental Testing
35	Fire Fighting
36	Guidance & Navigation
37	Guided Artillery
38	Gun Technology
39	Hardwar-i In Loop Simulation
40	High Performance Computing
41	Hydro Structures
42	Hypersonic Technologies
43	Life Support
44	Materials
45	Military Food Technology
46	Mines & Mines Detection
47	Missile Systems
48	Multi-Barrel Rockets
49	Munition/Ammunition

S. N.	Technology Area
50	Natural Hazard Mgmt.
51	Non-destructive Evaluation
52	Ocean Profiling
53	Parachute Technology
54	Passive Countermeasures
55	Propulsion Technologies
56	Protective Clothing & Gears
57	Quantum Technologies
58	Radar Technologies
59	Radome Technologies
60	Respiratory Management
61	Seeker Technologies
62	Sensors/Detectors
63	Soldier Support
64	Sonar Technologies
65	Space Situational Awareness
66	Space Technologies
67	Surveillance and Tracking
68	Swarm Technology
69	Terahertz
70	UAV
71	UGV
72	Underwater Defence Technologies
73	Wargaming
74	Warhead/Explosive & Ballistic Protection
75	Waste Management



Unveiling the 75 technology priority areas will provide a major fillip to the defence manufacturing sector by encouraging the industry to indigenise and innovate on defence technologies in order to place India on a self-reliance trajectory, thereby promoting military technology design and development in the country through engagement with industry and academia.

The 'DRDO Technology Foresight-2023' listing all areas, categories, and technology development activities, was also unveiled. The document identifies the technology areas on which various laboratories of the DRDO are currently working. It is available at www.drdo.gov.in. The list of activities identifies future technology areas that are required for the development of defence systems and defence R&D to strengthen the security of the nation. The webpage will list major technology tasks envisaged in the near future for defence R&D needs. Industry and academia are given a listing of various establishments of DRDO working in their respective areas, thereby establishing a seamless channel of understanding between various stakeholders.

Speaking on the occasion, the Chief of Defence Staff complimented the DRDO for organising the 'Anusandhaan Chintan Shivir' and stressed the importance of indigenous defence technologies for the Armed Forces.

In his address, Dr Samir V Kamat, Secretary DD R&D & Chairman DRDO, stated that the DRDO, industry, and academia should work in synergy to take the technologies from low to advanced

levels where they can be taken up for bulk production.

Dr Subrata Rakshit, DG (TM), Prof. Rangan Banerjee, Director, IIT-Delhi, and Shri Arun Ramchandani, Executive VP L&T, provided DRDO, academia, and industry perspectives on defence R&D during the Shivir.

Chief of Integrated Defence Staff to the Chairman, Chiefs of Staff Committee (CISC) Lt General Johnson P Mathew, DG (Admin) Air Headquarters Air Marshal PK Ghosh, senior officers of Ministry of Defence, and scientists from DRDO, industry leaders and academia experts were also present.

The DRDO with its network of laboratories and centres is deeply engaged in development of defence technologies covering various disciplines, like aeronautics, armaments, electronics, combat vehicles, engineering systems, instrumentation, missiles, advanced computing simulation, special materials, naval systems, life sciences, training information systems, and modern agriculture technologies. Achieving self-reliance in critical defence technologies and systems through the development of state-of-the-art weapon systems and equipment is one of the core activities of DRDO. DRDO has been interacting with various defence ecosystem stakeholders to foster the industry & academia cooperation to develop new technologies.

Raksha Mantri Shri Rajnath Singh presided over a day-long 'Chintan Shivir' on 6 July 2023. During the Shivir, the Department of Defence (DoD), Department of Defence Production (DDP), Department of Military Affairs

(DMA), Department of Ex-Servicemen Welfare (DESW), and DRDO organised separate brainstorming sessions, during which they discussed critical issues and ways to enhance their productivity. The departments identified an array of themes, on which eminent subject matter experts addressed the officers and shared their insights.

The Raksha Mantri reviewed the takeaways of the brainstorming sessions and discussed ways to implement the recommendations borne out of these deliberations. Raksha Rajya Mantri Shri Ajay Bhatt, Chief of Defence Staff General Anil Chauhan, Chief of the Army Staff General Manoj Pande, Defence Secretary Shri Giridhar Aramane, and other senior civil and military officials of the MoD also attended the day-long meeting. A number of themes and sessions were covered during the event.

Several innovative proposals emerged to boost domestic defence manufacturing, ex-servicemen's welfare, more reforms in the Armed Forces, & greater collaboration between DRDO and other research bodies.

Tweeting after the meeting, the Raksha Mantri said: "Had extensive discussions during the day-long 'MoD Chintan Shivir' today. Several important issues pertaining to strengthening India's Defence capabilities and the welfare of our Ex-Servicemen were discussed. I have directed all the concerned departments to prepare a time bound action plan and make a presentation on the Action Taken Report within 15 days."



DRDO AND CENJOWS'S SEMINAR AND EXHIBITION ON TECHNOLOGY ENABLED SENSOR-DECISION-SHOOTER SUPERIORITY

Chief of Defence Staff (CDS) General Anil Chauhan, PVSM, UYSM, AVSM, SM, VSM, has stressed the need for military capability development in the emerging warfare landscape. He was speaking as the Guest of Honour in a seminar and exhibition on 'Technology Enabled Sensor-Decision-Shooter Superiority', organised jointly by DRDO and the Centre for Joint Warfare Studies (CENJOWS) at DRDO Bhawan in New Delhi on 30 June 2023.

In his address, Gen. Chauhan underscored the achievements of the Armed Forces in achieving synergy and transparency in numerous sensor and shooter capabilities, including the integration of the latest communication and Artificial Intelligence (AI) technologies.

The CDS said that the Observe, Orient, Decide, Act (OODA) cycle needs to be at a higher tempo to be in step with the pace of warfighting made possible with cutting-edge technologies. Gen. Chauhan emphasised that capability development is being done through a scientific process and mentioned that interoperability and integration will grow manifold with theaterisation.

The CDS stated that a baseline understanding of space, cyber, and EW

technologies is important for all warfighters. He appreciated the efforts of DRDO and CENJOWS for bringing the Services, scientists, industry, and academia together for brainstorming the subject and mutual understanding of each other's requirements to meet future battlefield challenges.

Dr Samir V Kamat, Secretary, DD R&D and Chairman, DRDO, also attended the event. Dr Kamat in his address stated that with the proliferation of sensors, network-centric warfare is a reality in the future battlefield scenario. He highlighted that the security of such networks is paramount, and the passage of secure information in time is a necessity. He also underscored the salience of AI-driven autonomy.

Lt Gen Sunil Srivastava, Director, CENJOWS AVSM, VSM (Retd), Senior Military officers from the three Services, DRDO scientists, and industry representatives attended the seminar, which had discussions by various 'subject matter experts' on strategic and multi-domain awareness, information sharing (networks and communications), analysis, intelligence, and decision-making, and prompt and multi-domain targeting.

The seminar provided opportunities for military leaders, scientists, Think-Tanks to brainstorm emerging developments on the subject and provide various actionable points for all stakeholders.



CONTRACT FOR REALIZATION OF ENERGY MODULES FOR P-75 SUBMARINES

Naval Materials Research Laboratory (NMRL), Ambarnath, and Larsen & Toubro (L&T) signed a contract on 12 June 2023 for manufacturing of two energy modules for the Air Independent Propulsion (AIP) System for Kalvari Class (P-75) submarines. The contract was signed by Shri PT Rojatar, OS & Director, NMRL, and Shri Pankaj Chadha, VP, Submarines & Underwater Platforms, BU, L&T. The AIP has a force multiplier effect on the lethality of a diesel-electric submarine as it enhances its submerged endurance by several folds. AIP systems technology is unique in that it generates hydrogen on demand, thereby obviating the need for carrying hydrogen onboard, which is a major safety concern for a submarine. Also, the technology is green since the by-product of the reaction

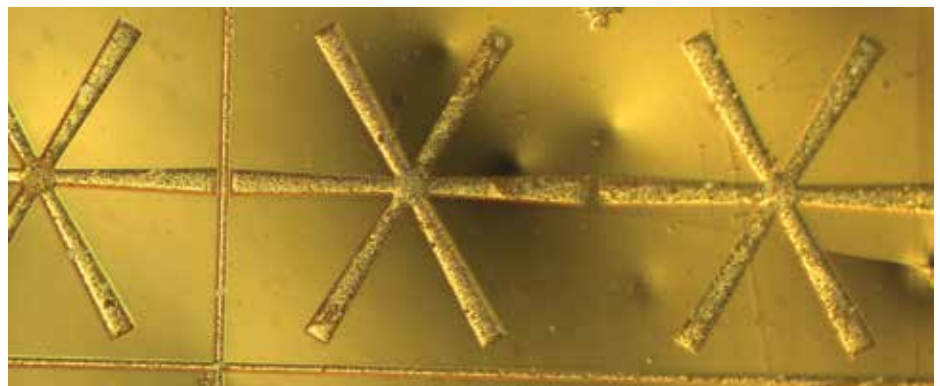


is water, which can be released into the oceans. AIP technology has been successfully developed by NMRL in association with Indian industries. The land-based prototype of AIP was evaluated by the Indian Navy during the user

trials held in 2021. The signing of the contract is considered an important milestone in the AIP programme. During the signing of this contract, senior scientists from NMRL and officials of Larsen & Toubro (L&T) were present.

CMSDS DESIGNED AND FABRICATED A MMW SEMICONDUCTOR DEVICE DELIVERING HIGH POWER

The Centre for Millimeterwave Semiconductor Devices & Systems (CMSDS), Kolkata, a unit of DRDO, successfully designed and fabricated a mmW semiconductor device delivering high power. The CMSDS successfully designed and fabricated millimeter-wave Impact Ionization Avalanche Transit-Time (IMPATT) diodes delivering about 8 Watts of pulsed power. The IMPATT





diode is a form of high-power semiconductor diode that is used as an oscillator at high frequencies for high power generation. It has a few distinct advantages, like a high operating range, compactness in size, economical, and reliability in working at high temperatures, which makes it suitable for onboard systems, hand-held devices, drone-based systems, satellite communication, and point-to-point military communication. Realising its huge potential for use in Indian defence applications, DRDO has set up CMSDS as a

dedicated center for developing mm-wave semiconductor devices and systems. Since its inception in the year 2019, CMSDS has been striving hard to design and fabricate the IMPATT diode with a high power rating. The high power rating of the diode indicates the maximum power that the diode can safely dissipate. To design an IMPATT diode, one needs to consider its efficiency, frequency of operation, low cost, low loss thermal and electrical constants, and output power. It is also important to achieve the

breakdown condition for IMPATT operation. After relentless efforts, CMSDS could design and fabricate the IMPATT diode, delivering a mmW pulsed power of 8 Watts.

A commendable feat indeed in consideration of the fact that CMSDS established this valued technology, and even in the international arena, only a handful of laboratories have the technology. This is also a great stride towards the goal of attaining self-reliance and fulfilling the dream of Make-in-India in defence applications in our country.

INTERNATIONAL YOGA DAY CELEBRATIONS

International Yoga Day (IYD) is celebrated annually on 21 June. The theme for this year's IYD is 'Vasudhaiva Kutumbakam' which beautifully encapsulates our collective aspiration for 'One Earth, One Family, One Future'. This year, the following laboratories of DRDO celebrated IYD at their respective places.

ACEM, Nasik

Advanced Centre for Energetic Material (ACEM), Nasik, celebrated IYD-2023 on 21 June 2023 with great enthusiasm. Shri TV Jagadeeswar Rao, General Manager, along with officers and staff of ACEM, participated in the event. Various asanas were performed, and their benefits were explained by the yoga instructor. GM, ACEM reiterated the benefits of yoga for the body, mind, and soul and asked employees to inculcate yoga as an indispensable habit in their lives. He also emphasised the importance of yoga for relieving stress and maintaining a healthy body.



ASL, Hyderabad

Advanced Systems Laboratory (ASL), Hyderabad celebrated IYD-2023 on 21 June 2023. Smt R Sheena Rani, OS & Associate Director, in her inaugural address, highlighted the importance of yoga and how it helps each one of us in achieving our highest potential and to experience enduring health and happiness. Ms Nithya Vasudevan, Isha Hata Yoga teacher took a session on 'Yoga Practices and Meditation to Find Inner Balance and Overall Wellbeing'. She told that "Yoga is meditation and meditation is yoga". Yoga and meditation are the techniques which connect our soul, mind, and body together. They make us strong, flexible, peaceful and healthy.



CAIR, Bengaluru

International Yoga Day (IYD)-2023 was celebrated at Centre for AI and Robotics (CAIR), Bengaluru, on 21 June 2023 with full enthusiasm and adhering to the theme, with participation from all the divisions, including officers, staff, and some contractual employees. A number of activities like warm-ups, light exercises, stretching, pranayama, and meditation were performed during the Yoga Day celebrations.





CMSDS, Kolkata

The Centre for Millimeterwave Semiconductor Devices & Systems (CMSDS), Kolkata, celebrated IYD-2023 on 21 June 2023. Smt Madhumita Chakravarti, Director, CMSDS, inaugurated the event. She highlighted the importance and need of yoga for humanity in day-to-day life for a healthy and happy lifestyle. The Director and all officials of CMSDS participated enthusiastically in the event. Various Asanas were performed, and their benefits were explained by the Yoga Instructor.



DEBEL, Bengaluru

Defence Bio-engineering and Electromedical Laboratory (DEBEL), Bengaluru, celebrated IYD-2023 on 21 June 2023 by organising a meditation session to experience the significance of yoga for a healthy and happy mind. This session was conducted by recorded meditation instructions of Padma Shri Dr HR Nagendra, S-VYASA University, Bengaluru, and led by Smt Sumathi SR, Sc 'F'. On the occasion, Dr TM Kotresh, OS & Director, DEBEL, highlighted the benefits of yoga in improving day-to-day life, which can lead to better physical and mental well-being.

DIPR, Delhi

Marking the iconic occasion of IYD-2023, Defence Institute of Psychological Research (DIPR), Delhi organised yoga session on 21 June 2023. Dr Arunima Gupta,

Director, DIPR led the celebrations and emphasised the significance of yoga as a pathway to holistic well-being. The yoga session conducted by Shri Hempal Punia, TO 'B' witnessed enthusiastic participation from all the employees of DIPR. On this special occasion, DIPR Annual Sports Meet certificates distribution ceremony was also held. While handing over the certificates, the Director reflected upon the importance of active participation of both men and women in yoga, sports and games which promotes goal setting, team work, and sportsmanship spirit, essential for any workplace. A happy mind and healthy body positively impacts productivity and is always an asset for organisation.



DMRL, Hyderabad

The Defence Metallurgical Research Laboratory (DMRL), Hyderabad, celebrated IYD-2023 during 21-28 June 2023. Dr NV Rama Rao, Sc 'F' & Chairman, Works Committee, welcomed the participants and emphasised the importance of yoga, the benefits of practicing yoga, and its impact on people's lives. Ms Nithya Vasudevan of the ISHA Foundation delivered a talk on 'Yoga Practices and Meditation for Professionals to Find Inner Balance and Overall Well Being' and subsequently conducted the mass yoga demonstration programme. About 200 employees

of DMRL participated in the event. Dr R Balamuralikrishnan, OS & Director, DMRL, also participated in the event.



DMSRDE, Kanpur

Defence Materials and Stores Research & Development Establishment (DMSRDE), Kanpur, celebrated IYD-2023 on 21 June 2023. Dr Kingsuk Mukhopadhyay, Sc 'G' & Officiating Director in his inaugural address highlighted the importance of yoga in our daily lives. Dr Santosh Kumar Tripathi, Sc 'F', coordinated the event and explained the benefits of yoga in achieving perfect harmony between the mind and body. He also showcased yogasanas, which were practiced by DMSRDE personnel.



DRL, Tezpur

Defence Research Laboratory (DRL), Tezpur, celebrated IYD-2023 on 21 June 2023. Dr Dev Vrat Kamboj, Director, DRL, felicitated Yoga Teachers from Vivekananda Kendra, Tezpur, addressed the participants in line with the theme, and urged them to make yoga practice part of their daily lives to keep themselves sound and healthy.



DYSL-QT, Pune

International Yoga Day-2023 was celebrated at the DRDO Young Scientists Laboratory-Quantum Technology (DYSL-QT), Pune, on 21 June 2023. The yoga session was conducted by yoga enthusiast Shri Darshit Suratwala in the presence of the Director, DYSL-QT, officers, staff, and other contractual employees. Lectures on the importance of yoga in day-to-day life were delivered by various yoga enthusiasts in the laboratory.



EMU, Hyderabad

On the occasion of the 9th edition of IYD-2023, a yoga day was organised on the lawns of the office premises of the Estate Management Unit (R&D), Hyderabad, on 21 June 2023. The programme was organised on a large scale with the objective of providing mental and physical fitness to the employees.

Yoga Guru Shri Shankar Goud, Meditation Masters Shri Venkat Reddy, Shri Ramesh, Dr Sheikh Ghaus Mohiddin, Addl. CCE & Estate Manager, and his team participated in the programme. On this occasion, the Estate Manager

emphasised that yoga rejuvenates human body, keeps him calm and fit, and should be practiced every day. Each participant should be an example for future generations.



ISSA, Delhi

The Institute for Systems Studies & Analyses (ISSA), Delhi, celebrated IYD-2023 on 21 June 2023 with zeal and enthusiasm. For awareness on the benefits of yoga, safety measures and other related information were shared with ISSA employees on a digital display board for the whole week. Yoga practice sessions by professional yoga instructor were organised in two consecutive sessions. A lecture on the 'Science behind Yoga' was organised in the evening session on yoga day. The lecture was delivered by Dr Mantu Saha, Sc 'F' & Head, Defence Institute Physiology and Allied Sciences (DIPAS), Delhi. A question-answer session on yoga awareness was also conducted.



ITR, Chandipur

The International Day of Yoga was celebrated at the Integrated

Test Range (ITR), Chandipur, on 21 June 2023. Shri HK Ratha, Director, ITR, inaugurated the event. In his inaugural address, he highlighted the importance and need of yoga for humanity in day-to-day life. Guru Gouranga Acharya delivered a lecture on yoga and its effects on the human body and soul. He also showcased yogasanas, which were practiced by ITR personnel. Many officers and staff of ITR attended the programme.



LRDE, Bengaluru

The 9th International Yoga Day was organised at the Electronics & Radar Development Establishment (LRDE), Bengaluru, on 21 June 2023. All officers and staff of LRDE participated in the programme. Shri Gampala Viswam, DS & Director, LRDE, was also present on the occasion.



NMRL, Ambernath

International Yoga Day-2023 was celebrated at the Naval Materials Research Laboratory (NMRL), Ambernath, on 26 June 2023 with the theme 'Har Dil Dhyani, Har Din Dhyani' in



association with the Heartfulness Institute, Mumbai. Shri PT Rojatkar, OS & Director, NMRL, in his address, encouraged the NMRL employees to practice yoga and meditation for the betterment of their physical and mental health. Yoga teachers from the Heartfulness Institute were invited to conduct yoga sessions during the event to spread awareness about the benefits of Yogasanas, Pranayama, Mudras, and Meditation. Shri Tushar Pradhan (Heartfulness Trainer) presented a book title, 'The Wisdom Bridge' to the Director, NMRL, as a token of love and appreciation.



NSTL, Visakhapatnam

The Naval Science & Technological Laboratory (NSTL), Visakhapatnam, celebrated the IYD-2023 on 21 June 2023. A mass yoga was conducted in the morning session. Dr Y Srinivasa Rao, DG & Director, NSTL,

along with 100 other members performed the Common Yoga Protocol. Shri A Visweswara Rao, Senior Security Asst. (qualified yoga teacher), provided guidance to the experienced and novice practitioners. Further, a meditation practice was conducted by the Heartfulness Organisers Mission, Visakhapatnam.



EXHIBITION ON GROWTH OF DEFENCE R&D ECOSYSTEM

In continuation of Azadi Ka Amrit Mahostav (AKAM) celebrations, Defence Bio-Engineering & Electromedical Laboratory (DEBEL), Bengaluru, successfully hosted an Exhibition themed, 'Growth of Defence R&D Ecosystem—Way to Atmanirbharta' showcasing the products developed by DEBEL on 24 June 2023. The exhibition was inaugurated by Dr Alka Chatterjee, Sc 'G' & Associate Director. This was a first-of-its kind open house initiative taken by DEBEL to inculcate scientific temperament in the youth of our nation. DEBEL is working on soldier support systems, and several products used by our Service combatants operating in extreme hazardous environments were showcased. Some of the products exhibited were the Critical Care Ventilator,

Telemedicine, Oxycare, Medical Oxygen Plant (MOP), HAPO Chamber, NBC Suit/Anti-G Suit, Exoskeleton, Microclimate Clothing, ILSS-OBOGS, Helicopter Oxygen System, and Underwater Submarine Escape Suit.

The exhibition had a turnout of more than 600 students from

various schools (Class 9–12), engineering colleges, and the general public. The objective of this special exhibition was to sow the seed of scientific inquisition in the young minds and motivate them to pursue a career in STEMM disciplines and join organisations such as DRDO in the future.



STEERING COMMITTEE MEETING AT NMRL

The 33rd Steering Committee Meeting on Warship Materials Technology was held at the Naval Materials Research Laboratory (NMRL), Ambarnath, on 22 June 2023 to review various ongoing projects. The meeting was chaired by VAdm Sandeep Naithani, AVSM, VSM, and COM, and co-chaired by Dr Y Sreenivas Rao, DS & DG (NS&M). Prior to the steering committee meeting, the working group met on 21 June 2023 under the chairmanship of RAdm K Srinivas, ACOM (D&R). The meeting commenced with a welcome address by Shri PT Rojatkar, OS & Director, NMRL. In his address, he brought out that continual support from the Indian Navy resulted in notable progress made by NMRL in



various projects. Dr Rao, in his introductory address, briefed the audience about DRDO's DcPP policy and advised NMRL to involve industry partners from the beginning of the project. Chairman VAdm Naithani, in his opening address, complimented

NMRL for the continual support and assistance being rendered to the Indian Navy. Following this, project leaders presented the work carried out and current status of the projects, in-house R&D activities, and new project proposals.

HANDS-ON PROTECTED CULTIVATION TECHNOLOGY TRAINING AT TAWANG

Hands-on-training on Protected Cultivation Technology was organized by Defence Research Laboratory (DRL), Tezpur to the users of 108 ENGR REGT Tawang (9800 feet MSL) on 29 June 2023. Training aimed at stimulating interest in protected farming not only for antioxidant-rich exotic vegetables and strawberries but also as a 'horticulture therapy' for the troops in high-altitude areas devoid of vegetation.

A total of 20 troops participated in the training, wherein management of greenhouse practices was detailed as a part



of learning by doing activities of the same. Agro-inputs such as strawberry runners, cucurbit seedlings, DRDO seed kits,

and water-soluble fertilizers were provided to the users for the efficient operation of the greenhouse.



CORPORATE REVIEW OF NPOL

The Corporate Review of the Naval Physical and Oceanographic Laboratory (NPOL), Kochi, was held under the Chairmanship of Shri KS Varaprasad, DS & DG (HR), on 18 June 2023. The Corporate Review Committee (CRC) was co-chaired by Shri Purusottam Bej, OS & DG (R&M), and Dr Y Sreenivas Rao, DS & DG (NS&M). Corporate Directors of DMS & DCW&E, DHRD, DOP, DFMM, DP&C, DIC, Rep DV&S, and AGE (I) R&D, Kochi, attended the meeting. Dr Ajith Kumar K, Sc 'G' & Director, NPOL, along with Directors (M), Director (Systems), Director (S&T), Associate Directors, and all Group Directors & Division Heads of Corporate Groups of NPOL, participated in the review meeting.

In his opening remarks, the Chairman of the CRC stated that Corporate Review is a mechanism with the aim of resolving corporate issues, and the laboratory can interact with



all corporate directors at a time. In his introductory remarks, the Chairman lauded NPOL as one of the best-performing laboratories under DRDO.

Director, NPOL, presented a brief on NPOL and elaborated on the activities and achievements of its corporate groups. During the deliberation, major issues such as scientific, technical, administrative, and service personnel requirements, engagement of apprentices, work, and other issues were discussed.

The CRC also provided directions on the next course of action for unresolved issues. The CRC team also had separate interactions with DRDS, DRTC, Admin & Allied Cadre, Works Committee, JCM IV, and registered unions. In their closing remarks, CRC appreciated the efforts taken by NPOL, as a major system laboratory, towards achieving self-reliance in sonar technologies and assured that it would do its best to address the issues raised during the deliberations.

NABL ACCREDITATION TO DFRL

The Defence Food Research Laboratory (DFRL), Mysuru, has been accredited with the National Accreditation Board for Testing and Calibration Laboratories (NABL), which is a Constituent Board of the Quality Council of India.

DFRL has been granted NABL Accreditation in accordance with ISO/IEC 17025:2017 in the disciplines of biological, chemical,

and mechanical testing as per the scope. Accreditation Certificate No.: TC-11645 with Issue Date: 16 May 2023 and Valid Till 15 May 2025

The testing parameters, which include chemical, biological, and mechanical, would be useful for routine food quality analysis. Further, the laboratory is working on expanding the NABL scope of testing facilities to cover maximum

food quality in accordance with Defence Food Specifications (DFS).

DFRL is an ISO certified laboratory for Quality Management systems (ISO 9001:2015) and Food Safety Management systems (ISO 22000:2018) and conducts regular audits relevant to quality management, food safety management, and testing capacities.



ANNUAL DAY CELEBRATIONS AT ACEM

Advanced Centre for Energetic Material (ACEM), Nasik, celebrated its 12th Annual Day on 30 June 2023 with immense zeal and enthusiasm. The event was graced by Dr Shailendra Vasant Gade, DS & DG (ACE), as the Chief Guest. The event started off with the release of balloons, followed by the planting of trees by the Chief Guest, General Manager, and senior scientists of ACEM.

Prior to the event, various sports competitions were conducted among ACEM employees, such as Cricket, Football, Volleyball, Table Tennis, Carom, Badminton, chess, and marathon, to improve team spirit, camaraderie, and to create an atmosphere of enthusiastic competitiveness. Shri TV Jagadeeswar Rao,



GM briefed about the work carried out at ACEM, including augmentation, strengthening of safety and quality, and welfare activities. Chief Guest, Dr Gade in his address, appreciated the work carried out at ACEM. He

also emphasised the need to take up R&D activities and leverage artificial intelligence for defence applications. Sports Awards, ACEM appreciation awards, and the Best Division Award were also presented by the Chief Guest.

ADHCS DEMONSTRATED TO HON'BLE RM

Air Direction and Helicopter Control Simulator (ADHCS) developed by Institute for Systems Studies and Analyses (ISSA), Delhi was demonstrated to Hon'ble Raksha Mantri Shri Rajnath Singh on 21 June 2023 at ND School, Southern Naval Command, Kochi, during the inauguration of Integrated Simulator Complex 'Dhruv'. ADHCS is a state-of-the-art training simulator software developed for training of Air Direction Officers of the Indian Navy for Air Direction & Helicopter Control.

The software enables simulation of combat scenarios for fixed wing aircrafts and deck landing scenarios for helicopters.



The system is designed to enable seamless transition of trainees from simulator to actual system on board ships. The technologically

advanced simulator is indicative of 'Aatmanirbhar Bharat' initiative and promises great defence export potential for the nation.



TRAINING COURSE AT DIPR

Course on Resilience Building: The Road to Mental Flexibility

The Defence Institute of Psychological Research (DIPR), Delhi, organised a three-Day course on 'Resilience Building: Road to Mental Flexibility' during 7-9 June 2023 for senior scientists of DRDO. The programme was structured to effectively guide the participants towards understanding their psychological strengths, identifying areas for improvement, and bringing in flexibility in thoughts and perceptions.

Dr Arunima Gupta, Director, DIPR, inaugurated the event, and while sharing the overview of the course, she stressed that the course will be highly beneficial in identifying hidden potential and thereby enhancing resilience.



The entire course was interactive, wherein the participants were encouraged to share their experiences and participate in various activities. The participants appreciated

the interactive sessions and engaging activities, which helped them understand their hidden potential and psychological strengths.

Special Lecture on Cyber Security

The Defence Institute of Psychological Research (DIPR), Delhi, organised a special lecture on Cyber Security on 22 May 2023. The lecture was delivered by a team of external experts in the domains of intelligence and security.

The lecture was aimed to create awareness amongst employees, and the engaging interactive lecture stressed the best practices in cyberspace, maintaining cyber hygiene, modus operandi in exploiting vulnerabilities through social engineering, emerging trends in cyber espionage, the Do's and

Dont's of social media, malware, and countermeasures.

Dr Soumi Awasthy, Sc G & Additional Director, thanked the team and highlighted that in today's digital world, it is imperative that each employee and

their family members be aware of growing cyber threats and plug the vulnerability gaps. Adhering to the cyber security guidelines is essential for ensuring a safe, secure, and trusted digital working environment.





TRAINING COURSES AT ITR, CHANDIPUR

GeM Procurement

Two-day training on 'GeM Procurement' was organised at Integrated Test Range (ITR), Chandipur during 12-13 July 2023. Shri HK Ratha, Director, ITR, inaugurated the course. During his inaugural address, the Director, ITR, urged the participants to get awareness and hands-on-training on GeM Procurement for a smooth workflow. The training was organised in collaboration with the Institute of Technology Management (ITM), Mussoorie. Forty-four participants from ITR attended the course. The course was organised by Shri PN Panda, Sc 'F' and his team.



QMS in Test Range Towards Performance Excellence

A course on 'Quality Management Systems in Test Range Towards Performance Excellence' was organised at ITR during 11-13 July 2023. Shri HK Ratha, OS & Director, ITR, inaugurated the course with Dr Susma Verma, Additional Director, Directorate of Quality, Reliability, & Safety (DQRS), DRDO HQrs, New Delhi.

Various topics like Software IV & V in a Test Range; Test and Evaluation of Telemetry and Tracking Instruments; QMS in Design and Development of Weapon Systems; QMS in Testing



Activities; and Reliability Analysis in the Evaluation of Weapon Systems were covered and

discussed in detail. The course was organised by Dr Pravakar Mallick, Sc 'F' and his team.

Awareness and Internal Auditing of QMS-based on ISO 9001: 2015

A training course on 'Awareness and Internal Auditing of QMS Based on ISO 9001:2015' was organised at Integrated Test Range (ITR), Chandipur, during 5-6 July 2023.

Mr Tapas Bandopadhyay, Sc 'G', and Mr Himadri Roy, Sc 'F', STQC Directorate, delivered the lectures on Fundamentals of QMS as per ISO 9001:2015, Internal Auditing

as per ISO 19011, and case studies in auditing. More than twenty officers of ITR participated in the course. The course was organised by Dr Pravakar Mallick, Sc 'F' and his team.



WORKSHOP ON FUTURISTIC SATELLITE TECHNOLOGIES AT DSP

The Directorate of Special Projects (DSP), Hyderabad, organised a one-day workshop and brainstorming session on 'Futuristic Satellite Technologies-2023' on 28 June 2023. At the outset, Smt Banda Rukmini, Sc 'G, welcomed the experts in space sciences from ISRO, academia, and the participants from DSP and associated work centers. Dr PSR Srinivasa Sastry, Director, DSP, gave a glimpse of developments in satellite technologies and the importance and necessity of the workshop. Dr Anupam Sharma, Associate Director, gave an overview of various initiatives and policies of the DRDO to support satellite



technologies in the current scenario. The faculties for the course were eminent in satellite technologies that including Shri Robert Devasahayam, Shri V

Koteswara Rao, Dr Surendra Pal, Prof. Sujit K Biswas, Shri Krishna Swamy, and Dr PS Goel.

The workshop was well received by all.

ROZGAR MELA-2023 AT NPOL

The Naval Physical and Oceanographic Laboratory (NPOL), Kochi, participated in the Rozgar Mela held at Kochi on 13 June 2023. The Mela was organised by the Dept. of Financial Services, Govt. of India, and saw participation from various departments such as the Dept. of Posts, the Dept. of Revenue, and organizations such as Cochin Shipyard, Public Sector Banks, etc.

24 candidates selected for the post of Technician 'A' in DRDO through the CEPTAM-10/DRTC Advertisement were issued appointment letters during the event, by the Prime Minister through video conferencing, at which Shri A Narayana Swamy,



Hon'ble Minister of State for Social Justice & Empowerment, was the Chief Guest. Two candidates who secured appointments in DRDO were also featured in the bytes segment streamed during the event.

Shri Wilson K Cherukulath, Sc. 'F' & Group Director (Personnel & Administration), represented DRDO at the event. NPOL facilitated the joining of 17 candidates on the same day itself for the post of Technician 'A'.



WORKSHOP ON WIRE GUIDED TORPEDO AT NSTL

A workshop on wire-guided torpedoes was conducted on 30 June 2023, by INS Satavahana under the aegis of Submarine Headquarter (SMHQ) on the nuances of torpedo wire guidance at Naval Science & Technological Laboratory (NSTL), Visakhapatnam. Dr Y Sreenivas Rao, DS & DG (NS & M), and Rear Admiral K Venkatraman, FOSM, inaugurated the workshop. The workshop was aimed at sharing the expertise gained during the four decades of handling wire-guided torpedoes. Scientists from NSTL and officers from the Indian Navy (totaling 30) participated in the workshop and opined that it was informative and helpful.



TRAINING ON DRDO RECORDS MANAGEMENT AT DIPAS

Directorate of Parliamentary Affairs, Rajbhasha and Organisation & Methods (DPARO&M), DRDO HQrs organised two-days training on 'DRDO Records Management' during 13-14 June 2023 at Defence Institute of Physiology & Allied Sciences (DIPAS), Delhi.

The training programme was designed and formulated in consultation with Dr Rajeev Varshney, Director, DIPAS. The training was conducted mainly for Delhi zone participants and DIPAS was the nodal laboratory. The inaugural address of the event was delivered by dignitaries Dr Ravindra Singh, Director, DPARO&M; Dr Somnath

Singh, Off. Director, DIPAS; and Smt Asha Tripathi, Sc 'G', Head, O&M Division.

Shri Syed Farid Ahmad, Deputy Director of Archives from National Archives of India enlightened the participants with his broad knowledge on management of classified records and discussed

the Public Records Act, 1993 with Public Records Rules 1997.

Shri CP Meena, Sc 'E'; Shri Manoj Kr Shakya, TO 'C', and Smt Chanda Anand, Admin Officer; and Smt Komal Ganatra, Asst. Dir (HRD), DRDO HQrs were the faculties for the training course.





APPOINTMENTS

Director, ASL



Shri BV Paparao, Distinguished Scientist, has assumed the charge of Director, Advanced Systems Laboratory (ASL), Hyderabad with effect from 1 July 2023. He obtained BTech in Mechanical Engineering from Andhra University and MTech in Production Engineering from JNTU, Hyderabad.

Shri Paparao started his career in Defence Research Development Laboratory (DRDL), Hyderabad, as Sc 'B' in the year 1987. He has contributed for more than 35 years in design and development of Solid Propulsion Systems and related sub-systems like Gas Generators for Missile Ejections from Canister, all stages of solid motors with regular and high energy propellants, auxiliary motors with cant nozzles upto 900, thrust vector control mechanisms like jet vanes, flex nozzle jet tab, etc. for solid motors for Projects B05, K4, A5, A1P, LV, PRALAY, SLCM, etc.

Shri Paparao was Associate Director and Group Director (Propulsion) in ASL till July 2021. He is Director, Centre for Advanced Systems (CAS), since August 2021 and is responsible for the production of AGNI Missile Systems and operation of number of unique test facilities like Hypersonic Wind Tunnel and Static Test Facilities for

Solid Rocket Motors. Now he is continue to hold additional charge of Director, Centre for Advanced Systems (CAS). Dr Paparao is recipient of several awards and also member of various societies.

Director, DIPR



Dr Arunima Gupta, Sc 'G', assumed the charge as Director, Defence Institute of Psychological Research (DIPR), Delhi, w.e.f. 02 May 2023. Dr Gupta is acclaimed for her significant contributions in the areas of personality assessment and military psychology during her distinguished career spanning over three and a half decades. In the year 1988, she joined DIPR, and started her professional journey as a young psychologist after undergoing initial training at DIPR and the Air Force Selection Board, Dehradun.

Dr Gupta played a pioneering role in the development of a selection system for women's entry into the Armed Forces and the introduction of a two-stage selection system. Her leadership in guiding research endeavours, continuous training of assessors, and standardisation of the selection system was instrumental in evolving ingenious solutions and strengthening psychological support for the Indian Armed

Forces. The spin-offs of her research work have benefited the Tri-Services, Central Armed Police Forces, security agencies, and other civilian organisations of national repute. She coordinated several research projects and training programmes, initiated collaborations with academia, and significantly contributed to international joint collaborations.

As an expert member of various selection committees of the Indian Armed Forces and advisory member of study groups, she was vital in the formulation of progressive policies and envisioning futuristic research areas.

Dr Gupta is a postgraduate in Psychology from HNB Garhwal University, Uttarakhand, and received her PhD in psychology from Bharathiar University. She is a Life Member of various academic and professional societies, such as the Indian Science Congress Association, the Indian Academy of Applied Psychology, and the Indian Academy of Social Sciences. She co-edited books, authored publications in reputed journals, national and international conferences, authored technical reports, manuals, and guides, and contributed chapters to many Books.

In recognition of her sustained R&D contributions, she has been conferred with the DRDO National Science Day Oration Award and the Technology Group Award.



Director, NSTL



Dr Abraham Varughese, Sc 'G' assumed charge as Director, Naval Science & Technological Laboratory (NSTL), Visakhapatnam, on 1 July 2023. An alumnus of the University of Kerala and IIT Delhi, Dr Varughese holds a Doctorate in Computer Science & Engineering

from Andhra University, and was awarded the Gold Medal for Best PhD in the engineering stream. He has over three decades of experience in the design and development of naval systems and spearheaded the indigenous development of underwater weapons at the laboratory. He is the Chairman of the IEEE Visakhapatnam Bay Section and a Fellow of a number of professional societies. He succeeds Dr Y Sreenivas Rao, who has taken over as Director General, Naval Systems & Materials, DRDO.

Higher Qualifications Acquired



Dr M Sankar, Sc 'E', Defence Metallurgical Research Laboratory (DMRL), Hyderabad, has been elected as an 'Associate Fellow of the Telangana Academy of Sciences' for the year 2021.

Awards and Recognitions

International Outstanding Researcher Award 2023

The International Outstanding Researcher Award-2023 was conferred on Dr G Gunasekaran, Sc 'F' and Dr Ganesh S Dhole, Sc 'D' of the Naval Materials Research Laboratory (NMRL), Ambarnath, in recognition of their remarkable and outstanding contributions in the field of coating for devoting their talent, efforts, and performance to developing a Fluorescence-Based corrosion-detecting epoxy coating for marine applications.

The award was presented by Asia Research Awards during Asia's Science, Technology, and Research Awards (ASTRA) Congress-2023, held on 1 July 2023 at Tiruchirappalli, Tamil Nadu.



Dr G Gunasekaran, Sc 'F' and Dr Ganesh S Dhole, Sc 'D' receiving the award

VISITORS TO DRDO LABS

CAIR, Bengaluru

Rear Adm. Rahul Shankar, ACNS CS NCO, visited CAIR, Bengaluru, on 20 June 2023. The Admiral was briefed about the various ongoing Naval projects, such as OPMS and INCOP. A demonstration for OPMS Lite and OPMS Aviation modules, as well as a presentation on the OPMS Planning module, were given to the Admiral. The ACNS lauded the efforts put in by the team at CAIR and assured CAIR of every help and support possible from his side towards the smooth progress of the projects, culminating in a successful launch as per the planned schedule.



CASDIC, Bengaluru

* Air Marshal Ashutosh Dixit, AVSM, VM, VSM, Deputy Chief of Air Staff (DCAS), IAF, visited the Combat Aircraft Systems Development & Integration Centre (CASDIC), Bengaluru, on 17 June 2023. Shri CH Durga Prasad, Center Head, CASDIC, gave a brief on various activities of the center. The DLRL & IRDE teams participated in the review meeting via video conference. Air Cmdr. K Appa Rao, Team Director & Officers of the IAF (PMT), CASDIC, apprised DCAS on the progress of respective projects and flight trials.



* Vice Admiral Sanjay Mahindru, AVSM, NM, Deputy Chief of Naval Staff (DCNS), Indian Navy, visited CASDIC on 12 June 2023 along with dignitaries from ADA, IHQ MoD (Navy), NFTC & HAL FLT (OPS). Shri CH Durga Prasad, Center Head, gave a brief on various activities of the laboratory.



DFRL, Mysuru

* Dr SV Gade, DS & DG (ACE), visited the Defence Food Research Laboratory (DFRL), Mysuru, on 15 June 2023. Dr Anil Dutt Semwal, Director, DFRL, welcomed the guest and gave a brief overview of DFRL's R&D achievements. Dr R Kumar, Sc 'G', Associate Director, gave an in-depth overview of the R&D activities of the DFRL, including ration development, indigenization of food processing equipment, instant and convenient food products for the Gaganyaan mission, food packaging technologies, training of troops, etc.

* Shri KS Varaprasad, DS & DG (HR) visited DFRL on 12 June 2023. Dr Semwal gave a brief overview of DFRL's R&D achievements. Dr R Kumar, Sc 'G', Associate Director, gave a presentation on on-going R&D activities of the laboratory, including ration development, indigenisation of food processing equipment, instant and convenient food products for the Gaganyaan mission, food packaging technologies, training of troops, etc.



DGRE, Chandigarh

Dr Shailendra Vasant Gade, DS & DG (ACE), Pune visited Defence Geoinformatics Research Establishment (DGRE), Chandigarh on 6 July 2023. Dr PK Satyawali, Director, DGRE welcomed DS & DG (ACE), and briefed him on the progress of ongoing projects, R&D activities, various operational activities, and support services provided to the users by DGRE. DG (ACE) interacted with all the Associate Directors and Divisional Heads of DGRE.



DMSRDE, Kanpur

Shri Rajeev Saxena, IRSS, Joint Secretary, Ministry of Textiles, visited the Defence Materials and Stores Research & Development Establishment (DMSRDE), Kanpur, on 28 June 2023. There was a briefing about the ongoing research activities of DMSRDE by Dr SM Abbas, Sc 'G' & Officiating Director, DMSRDE, followed by discussion and demonstration of products and technologies developed by DMSRDE.



HEMRL, Pune

* Dr(Ms)ChandrikaKaushik, DG (PC&SI), visited the High Energy Materials Research Laboratory (HEMRL), Pune, on 21 June 2023. During the visit, presentations were made by the senior scientists on status of technologies & their achievements in the fields of tank ammunition, high explosives, solid rocket propellant, pyrotechnics, nanomaterials, ToT at HEMRL, and test facilities at HEMRL. She also visited high-performance gun propellant, MMPPF, and UPP facilities at HEMRL.

* Rear Admiral B Vashishta, DG, NAI, New Delhi, visited HEMRL on 3 July 2023. During the visit, presentations were made by the senior scientists on the life extension of club missiles, naval flares, warheads for naval

missiles, and the indigenization of Pyro cartridges under Articles 2556 and 2600. He interacted with senior scientists at the laboratory and discussed various issues related to projects related to Navy.



LRDE, Bengaluru

* Air Marshal Ashutosh Dixit, AVSM, VM VSM, DCAS visited Electronics and Radar Development Establishment (LRDE), Bengaluru on 16 June 2023. He was given a presentation on LRDE and airborne projects. Shri Gampala Viswam, DS & Director, LRDE and other senior officers were also present. Air Mshl Ashutosh Dixit visited the Quick Reaction Surface-to-Air Missile (QRSAM) Radar System for a brief demonstration and also visited the Radar Gallery of the LRDE.

* Shri Giridhar Aramane, Defence Secretary, MoD, visited LRDE on 17 June 2023. Defence Secretary reviewed the LRDE projects and collaboration with M/s BEL. He also visited the gallery of Air Defence Fire Control Radar (ADFCR), Air Defence Tactical Control Radar (ADTCR), and QRSAM Radar.



NOAR, Kurnool

Shri Giridhar Aramane, Defence Secretary, MoD, visited the National Open Air Range (NOAR), Kurnool, on 8 June 2023. On behalf of the State Government of Andhra Pradesh, Dr Srijana, IAS, Collector & District Magistrate, Kurnool, Abhishek Kumar, IAS, Sub-Collector, Adoni; Shri G Krishnakanth, IPS, Superintendent of Police; Smt N Mourya, Joint Collector; and A Bhargav Teja, IAS, Municipal Commissioner of Kurnool district, welcomed the Defence Secretary as per protocol. Dr BK Das, DS & DG (ECS), along with Sri N Srinivas Rao, DS & Director, DLRL, and other senior scientists, greeted the dignitary. Shri H



Sudhir, Sc 'G' & Project Director, made a detailed presentation on various test facilities established at NOAR and civil infrastructure

built by CCE (R&D)S. Dr Das briefed the Defence Secretary about NOAR and its role in the test and evaluation of EW systems.