

# DRDO

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Azadi Ka  
Amrit Mahotsav

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## HIGH SPEED EXPENDABLE AERIAL TARGET—ABHYAS, SUCCESSFULLY FLIGHT TESTED





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# HIGH SPEED EXPENDABLE AERIAL TARGET— ABHYAS, SUCCESSFULLY FLIGHT TESTED

**A**bhyas—High-speed Expendable Aerial Target (HEAT) was successfully flight-tested from the Integrated Test Range (ITR), Chandipur off the Coast of Odisha on 29 June 2022. Abhyas is designed and developed by Aeronautical Development Establishment (ADE), Bengaluru. The performance of the aircraft at low altitudes including sustained level and high maneuverability was demonstrated during the test flight. The target aircraft was flown from a ground-based controller in a pre-designated low-altitude flight path, which was monitored by various tracking sensors

deployed by ITR, including radar and an electro-optical targeting system.

The air vehicle was launched using twin under-slung boosters which provide the initial acceleration to the vehicle. It is powered by a small gas turbine engine to sustain a long endurance flight at high subsonic speed. The target aircraft is equipped with a micro-electromechanical systems-based inertial navigation system for navigation along with the flight control computer for guidance and control an indigenous radio altimeter for very low altitude flight and a data link for encrypted

communication between the ground control station and target aircraft. The vehicle is programmed for fully autonomous flight.

Raksha Mantri Shri Rajnath Singh congratulated DRDO, Armed Forces, and the industry for the successful flight trial of Abhyas and said that the development of this system will meet the requirements of aerial targets for the Armed Forces. Dr G Satheesh Reddy, Secretary, Department of Defence R&D and Chairman DRDO appreciated the efforts of the teams associated with the design, development, and testing of the system.



## INTERMEDIATE-RANGE BALLISTIC MISSILE, AGNI-4, SUCCESSFULLY TESTED

Defence Research & Development Organisation (DRDO) conducted a successful training launch of an Intermediate-Range Ballistic Missile-Agni-4 on 6 June 2022 from APJ Abdul Kalam Island, Odisha. The test was part of routine user training launches carried out under the aegis of the Strategic Forces Command.

The launch validated all operational parameters as also the reliability of the system. The successful test reaffirms India's policy of having a credible minimum deterrence capability.



## MAIDEN STATIC TEST OF LARGE SOLID ROCKET MOTOR WITH HIGH PERFORMANCE PROPELLANT

A maiden static test of a large case-bonded rocket motor of 3T class with high-performance propellant with hazard division of HD1.1 category was successfully carried out on 13 April 2022 at Advanced Center for Energetic Materials (ACEM), Nasik. The composite case rocket motor was designed and realised indigenously. The main objective of the static test was to validate the design for a new configuration having high-performance propellant (HD1.1) compared to the Mark-I version and to evaluate the augmentation factor. The motor has a submerged nozzle with provision for actuation, which is also realised indigenously.



The 33T class (Thrust) solid rocket motor is one of the largest rocket motors with HD1.1 class of propellant in a composite casing being processed in India. The static testing of the motor involved data acquisition of 30 channels for temperature, 36 channels for strain, 2 channels

for thrust, and 4 channels for pressure in addition to instrumentation for displacement, pyro currents, actuators signals, and high-speed videography. Based on the data recorded, the optimised insulation thickness was validated for high-performance propellant.

# AUTOMATED NAVAL MENU DESIGN SOFTWARE FOR NAVY

The trial version of Automated Naval Menu Designer software developed by Defence Institute of Physiology and Allied Sciences (DIPAS), Delhi as a part of Continuous Naval Diet Assess and Plan Software was handed over to Cmde Neeraj Malhotra, Commanding Officer, INS Hamla, Mumbai on 13 June 2022 by Dr Rajeev Varshney, Director, DIPAS. The team of scientists involved in the development, Dr Som Nath Singh, Dr R Sugadev, Dr YK Sharma, Ms Vandana Kirar, Ms Pavitra Rani Gautam along with Lt Cdr Arjun Kapoor, Senior Training Officer, INS Hamla were present during the event.

The software is designed to provide a balanced diet that includes eating adequate calories



and nutrients for optimum performance.

Moreover, the software helps Food Captain of naval ships to pick up the right kind of menu quickly depending upon the daily

activities of the particular unit. The automated software could save time in planning the naval diet menu, balanced diet planning from a week to a month and save man-hours in dietary planning.

# PARTICIPATION OF DRDE IN 50TH OFFICIAL OPT

The Organisation for the Prohibition of Chemical Weapons (OPCW) conducted the 50th official OPCW Proficiency Test (OPT) from 22 October 2021 to 28 November 2021. Twenty-one laboratories participated in the 50th official OPT, representing the following eighteen state parties: USA, UK, India, Russia, China, France, Switzerland, Iran, Pakistan, Norway, Japan, Malaysia, Poland, Republic of Korea, South Africa, Brazil, and Algeria. Three laboratories from

India participated in the 50th official OPT namely, Central Excise & Custom Laboratory, Indian Institute of Chemical Toxicology, CSIR, and Defence Research & Development Establishment (DRDE), Gwalior.

DRDE, VERTOX laboratory correctly identified all the six reportable spiked chemicals in six different complex environmental matrices and earned an 'A' grade in the 50th official OPT to sustain the status of 'Designation' by OPCW for off-site analysis of

chemical warfare agents and their environmental markers.

DRDE has been participating in official OPTs since 1997 and striving for excellence to solve the challenges imposed in official OPT by developing new analytical methods comprehending the real-world analytical problems in the area of chemical weapons.

With OPCW designation, DRDE will play a significant role in the verification regime of Chemical Weapon Convention (CWC) for verification of the CW agents.

# CONTRACT WITH BDL FOR PROCUREMENT OF ASTRA MISSILE & ASSOCIATED EQUIPMENT FOR IAF & IN

In a major boost to Prime Minister Shri Narendra Modi's vision of 'Aatmanirbhar Bharat', the Ministry of Defence (MoD) signed a contract on 31 May 2022 with Bharat Dynamics Limited (BDL) for the supply of Beyond Visual Range (BVR) Air-to-Air Missile Astra MK-I and associated equipment for the Indian Air Force (IAF) and Indian Navy (IN). The missile has been indigenously designed and developed by DRDO, based on the staff requirements issued by the IAF catering for BVR as well as close combat engagement reducing the dependency on foreign sources.

The air-to-Air missile with BVR capability provides large stand-off ranges to own fighter aircraft which can neutralise the adversary aircraft without exposing itself to adversary air-defence measures, thereby gaining and sustaining superiority of the air space.

The missile is technologically and economically superior to many such imported missile systems. Astra MK-I missile and all associated systems for its launch, ground handling, and testing have been developed by DRDO in coordination with the IAF.

The missile, for which successful trials have already

been undertaken by the IAF, is fully integrated on the Su30 MK-I fighter aircraft and will be integrated with other fighter aircraft in a phased manner, including the Light Combat Aircraft (Tejas). The IN will integrate the missile on the MiG 29K fighter aircraft. The Transfer of Technology (ToT) from DRDO to BDL for production of the Astra MK-I missile and all associated systems has been completed and production at BDL is in progress. This project will act as a catalyst for the development of infrastructure and testing facilities at BDL.

## LATOT FOR MRE RATION TECHNOLOGY

Defence Food Research Laboratory (DFRL), Mysuru, signed License Agreement on Technology Transfer (LAToT) for MRE Ration Technology with M/s Nihari Corn LLP, Nasik. Dr Anil Dutt Semwal, Director, DFRL and Shri Shailender Surinder Singh and Shri Shishir Diwakar Mude, Partners, M/s Nihari Corn LLP, Nasik signed the agreements on 18 May 2022 at Mysuru.

The inventors, Dr R Kumar, Sc 'F', Head, Food Engineering and Packaging Division, Dr Jonsy George, Sc 'F', and their team (Retort Processed Ready-to-Eat Foods), Dr DD Wadikar, Sc 'F', and their team (shelf-



stable, no preservative chapatias), and Dr M Pal Murugan Sc 'E', Head, Technology Transfer and Exhibition Division, DFRL were

present during the occasion. M/s Nihari Corn LLP is one of the largest manufacturers of food products and beverages.

# NATIONAL TECHNOLOGY DAY CELEBRATIONS

## ASL, HYDERABAD

Advanced Systems Laboratory (ASL), Hyderabad conducted three days workshop on 'Emerging Trends in Missile Integration Technologies' during 9-11 May 2022 as National Technology Day (NTD) celebrations and Azadi ka Amrit Mahotsav. Smt R Sheena Rani, Associate Director, and Project Director, DHVANI welcomed the august gathering and talked about the importance of the day. Dr M Rama Manohara Babu, DS & Director, ASL delivered the inaugural address. About 450 participants from ASL, Defence Research and Development Laboratory (DRDL), Research Centre Imarat (RCI), Centre for Advanced Systems (CAS), and Strategic Systems Quality Assurance Group (SSQAG) attended the workshop. Eminent scientists from DRDO and ISRO delivered talks on various aspects of missile integration technologies. Dr J Gururaja Rao, Sc 'F' delivered an NTD oration on 'Indigenous Development of Carbon/Carbon Aircraft Breaks' on 11 May 2022. Shri PVG Brahmanandam, OS & Associate Director, ASL presented the Titanium medal and certificate to the orator.



## CAIR, BENGALURU

Centre for Artificial Intelligence and Robotics (CAIR), Bengaluru celebrated NTD-2022 on 11 May 2022. Dr Vivek Raghavan, Chief AI Evangelist (Volunteer) at EkStep Foundation, Chief Product Manager, and Biometric Architect at UIDAI was the Chief Guest for the event.

Dr Subrata Rakshit, OS & Director, CAIR delivered the welcome address. This was followed by the keynote address by Dr Raghavan. He spoke about the development of indigenous biometric solutions for large-scale users like UIDAI, fostering startups for international competitions, leveraging community outreach for Indian languages NLP and speech recognition solutions.

Dr Raghavan presented the Technology Day medal and certificate to Shri MA Rajesh, Sc 'F'. Shri Rajesh delivered the NTD oration on 'Architecting an Enterprise GIS for Tri-Service Applications'. In his talk, he covered the fundamentals of Geographical Information System (GIS) and the features of a GIS to be considered while designing it for military application.



## DFRL, MYSURU

National Technology Day was celebrated at Defence Food Research Laboratory (DFRL), Mysuru, on 11 May 2022. Dr R Kumar, Sc 'F', Associate Director, DFRL & Head, Food Engineering & Packaging Division delivered the NTD oration on 'Technological Strategies for Ration Design and Development'. In his oration, he highlighted energy expenditure requirement of soldiers at different terrain, weapon, and theatre specific environments, nutritional requirements for combat operations, suitability of convenience foods with advanced packaging materials and development of specific food products for the Armed Forces and Paramilitary troops. Dr Anil Dutt Semwal, Director, DFRL presented NTD medal and certificate to Dr R Kumar. An open day exhibition was conducted on the occasion. Students from schools and colleges of Mysuru participated in the programme.



## DGRE, CHANDIGARH

National Technology Day celebrated at DGRE on 11 May 2022. The Chief Guest for the occasion, Dr Satish Kumar, Padma Shri, Former DG (MSS), DRDO and former Director,

NIT Kurukshetra delivered a talk highlighting the challenges and opportunities for relevant technologies and motivated young scholars to work in this direction to benefit the nation. On the occasion, Dr PK Satyawali, Director, DGRE addressed the gathering and highlighted the critical and significant role of DGRE in geo-hazard management across entire Himalaya and emphasised to work on future technologies regarding various geo-informatics products and solutions for armed forces in fast changing global scenario. Shri Karamjeet Singh, Sc 'D' delivered a technical talk on 'Design and Development of a Real-Time Avalanche Warning System using Acoustics Emission Technology'.

Under the aegis of Azadi Ka Amrit Mahotsav, 70 students of Class 10 to class 12 of four different schools, viz. Kendriya Vidyalaya, Sector 31-D, Chandigarh, Govt Model Senior Secondary School also visited the laboratory.



### DMRL, HYDERABAD

Defence Metallurgical Research Laboratory (DMRL), Hyderabad celebrated NTD-2022 on 25 May 2022. Dr T Raghu, OS & Associate Director delivered the Technology Day oration on 'Development of Deformation Processing Techniques for Manufacturing Critical Components of an Aero

Engine'. Dr Raghu was presented the NTD medal and a certificate by Dr G Madhusudhan Reddy, OS & Director, DMRL.



### NPOL, KOCHI

Naval Physical and Oceanographic Laboratory (NPOL), Kochi celebrated the NTD-2022 on 11 May 2022. Shri M Suresh, Sc 'G' & Officiating Director, NPOL, inaugurated the programme and addressed the gathering. The NTD oration was delivered by Dr Sreeram Radhakrishnan on 'Remote Sensing of Seafloor Topography from High Frequency Acoustic Backscattering Measurements in Shallow Water'. The oration summarised the method of estimating seafloor interface roughness characteristics occurring at various scales based on measurements of acoustic backscattering at a shallow water site. The mechanism of backscattering was elucidated



with the help of acoustic modeling and measurements.

### NSTL, VISAKHAPATNAM

Naval Science & Technological Laboratory (NSTL), Visakhapatnam celebrated NTD-2022 on 11 May 2022. Dr Samir V Kamat, DS & DG (NS&M) in his speech stressed NSTL community to accelerate along with the rate of change of technological development all over the world. He urged to keep pace with state-of-the-art technologies and utilise them to the extent possible. He told that in line with this, DRDO has already established ten Centre's of Excellence in various academic institutes with participation of industry. On the occasion, Titanium medal and Director's Commendation Certificate has been presented to Shri Sunny Verma, Sc 'D', for his oration on 'A Monte Carlo-based Simulation Scheme for Failure Studies of Parachute Assisted Air Drop of UAVs'.

Senior scientists Shri PVS Ganesh Kumar, Shri BVSS Krishna Kumar, Dr A Srinivas Kumar, Shri GV Manoj Kumar, Sc 'F', other scientists, officers and staff of NSTL participated in the programme.



## BIRTH ANNIVERSARY CELEBRATION OF BHARAT RATNA DR BR AMBEDKAR

Centre for Artificial Intelligence and Robotics (CAIR), Bengaluru, celebrated Bharat Ratna Baba Saheb Dr BR Ambedkar's 131st Jayanthi on 14 April 2022. On the occasion, a seminar was organised by Smt Desiraju Padma, Sc 'G' on the life of Bharat Ratna Dr BR Ambedkar. A blood donation camp was also organised by Rotary Bangalore TTK Blood Bank. Several employees of CAIR donated blood during the camp.



## CELEBRATION OF YOGA MAHOTSAV-2022

Defence Research Laboratory (DRL), Tezpur, organised Yoga Mahotsav-2022 on 30 May 2022 as part of the countdown day programme of International Day of Yoga (IDY) at Agnigarh, an iconic place located at the banks of the mighty Brahmaputra in the city of Tezpur, Assam. Dr Dev Vrat Kamboj, Director, DRL delivered a welcome address and highlighted the importance of ancient Indian practice of yoga and urged the participants to make yoga practice part of their daily life to keep themselves sound and healthy. Shri Chatra Bhukhon Gogoi, District & Session Judge of Sonitpur district graced the occasion as the Chief Guest. He addressed the gathering emphasising the benefits of yoga and its importance in maintaining a healthy lifestyle. Other eminent personalities, viz. Ms Barsha Talukdar, Executive Officer, Tezpur Municipal Board



& Representative of DC, Sonitpur; Dr PK Bora, Director, NERIWALM; Prof. B Ramakrishnan, Head, ISI NE Centre, Tezpur; and Shri DK Sinha, DIG, Frontier HQ, SSB, Tezpur participated along with officers, staff, and research scholars of DRL. Ms Momita Gogoi, Coach of Yogasana Sports Association, Assam conducted the Yoga session. She deliberated

on the importance and various aspect of yoga and highlighted that yoga is not only for the well-being of our body but more importantly for our mind and soul and advised to adopt yoga practices in our day-to-day life. An exhibition on various products and technologies developed by DRL was also showcased to the invited dignitaries.

## TRAINING COURSE ON RECORDS MANAGEMENT

Two days training programme on 'Records Management for Hyderabad Zone' was conducted at Defence Electronics Research Laboratory (DLRL), Hyderabad. The course was designed and organised by the Dte of Parliamentary Affairs, Rajbhasha and Organisation & Methods (DPARO&M) on 19-20 May 2022. All laboratories of Hyderabad zone participated in the course and course faculties were from DPARO&M and the National Archives of India (NAI).

The programme was inaugurated by Shri N Srinivas Rao, OS & Director, DLRL with an invocation song in the presence of



Smt Asha Tripathi, Sc 'G', Associate Director, DPARO&M, Smt Soma Vashishta, Sc 'G', Chairperson, Records Management Training Committee and Smt Lakshmi, Sc 'F', Records Officer & Member Secretary, Record Management

Training Committee, along with senior officers of DLRL and participants. The participants of the training programme were also taken for a brief tour of Sangam Exhibition Hall which showcases DLRL products and technologies.

## DRDO E-RESOURCES REVIEW AND MONITORING COMMITTEE MEETING

Defence Scientific Information & Documentation Centre (DESIDOC), Delhi is responsible for implementation of DRDO e-Resources Consortia. DRDO e-Resources Review and Monitoring Committee periodically meet and discuss issues pertaining to laboratories requirements. 23rd Meeting of DRDO e-Resources Review and Monitoring Committee was held at Defence Research & Development Laboratory (DRDL), Hyderabad on 27 May 2022. Dr K Nageswara Rao, Director, DESIDOC welcomed the Chairman and members of the newly constituted committee. He emphasised to improve the readership among DRDO scientific community and



also focused on to popularise e-journals by different means.

Dr GAS Murthy, Sc 'H' & Director, DRDL was the Chief Guest of the meeting. He stressed on maximising the usage and accessibility of the resources. Dr PVRR Bhogendra Rao, Chairman, Committee highlighted on the importance

of e-Resources for information dissemination among DRDO scientific community. Committee members deliberated on the future requirements and benefit of e-Resource consortia.

The meeting was attended by committee members and library professionals from Hyderabad-based DRDO laboratories.

## INDUSTRY MEET ON REPM TECHNOLOGIES

Defence Metallurgical Research Laboratory (DMRL), Hyderabad has undertaken the development of Nd-Fe-B magnets of various grades for commercial and strategic applications. Several grades of high energy and high operating temperature Nd-Fe-B magnets have been developed by the laboratory. In this context, DMRL organised a one-day Industry Meet on 'Rare Earth Permanent Magnet (REPM) Technologies' with a focus on Nd-Fe-B magnets on 13 May 2022. The Meet aimed to discuss the relevant issues in indigenous production of REPMs in the country involving all the stakeholders from PSUs, R&D organisations, and the industry working in the development, manufacturing, and application engineering of REPMs as well as production of RE raw materials. About 50 participants from R&D organisations, PSUs, and industry



attended the Meet.

The scientists working in the related activity from DMRL and BARC participated actively in the presence of Dr SV Kamat, DS & DG (NS&M) DRDO, Shri D Singh, CMD, IREL, Dr G Madhusudhan Reddy, OS & Director DMRL,

and Dr T Raghu, OS & Associate Director, DMRL. During the day-long event, technical presentations were made by selected participants and at the end, an open discussion session was conducted to take the views of all the participants.

## SPECIAL COURSE ON BASIC SAFETY MANAGEMENT

Centre for Fire, Explosive and Environment Safety (CFEES), Delhi organised a three days course on 'Basic Safety Management' during 18-20 May 2022 in collaboration with DQRS, DRDO HQ for DRDO/MoD employees. A total of 38 participants from MoD attended the course.

The objective of the course was to familiarise the employees of DRDO/MoD with the basic principles of safety management and to give an insight into safety management aspects in the areas of explosives, fire, environment, electrical, CBRN, and biosafety.

The awareness programme was aimed to create a preventive culture, scientific mindset, and organised approach to

safety issues while working in a chemical laboratory/hazardous atmosphere.



## TRAINING PROGRAMME ON MAXIMISING USAGE OF E-RESOURCES

In a series of the on-spot training programme, Defence Scientific Information and Documentation Centre (DESIDOC), Delhi in association with Armament Research & Development Establishment (ARDE), Pune has organised a Training Session on 'Maximising usage of e-Resources using DRDO e-Library and Writing High-Quality Research Paper' at ARDE, Pune on 14 June 2022 for Pune-based DRDO laboratories. The programme was organised to generate awareness of e-library services to access subscribed and unsubscribed resources of DESIDOC and to develop paper writing skills. The training programme was attended by more than 50 scientists, officers, staff and library professionals from ARDE, R&DE (Engrs.), and HEMRL. Shri SK Nayak, Officiating Director, ARDE highlighted the importance

of the library and explained the programme during his opening remarks. Dr K Nageswara Rao, Director, DESIDOC emphasised on the overall existing services and new initiatives planned by DESIDOC. Shri AK Pandey, Sc 'E' & Head-Information Centre for Armament Technology (ICAT), ARDE delivers a talk on 'ICAT e-Resources and Services in Digital Environment'. He shared innovation, work in progress, and vision of ICAT. Smt Alka Bansal, Sc 'F', DESIDOC discussed various publications of DESIDOC. During her presentation, she particularly discussed Monograph publication, its rules and grants to the authors. The programme covered a live demonstration of the DRDO e-library platform, its services, and usage of subscribed e-resources. The demonstration was conducted by Shri Nishant

Kumar, Sc 'E' with a team from Refread. Elsevier's representative had a session on publishing high-quality research papers and how to use Scopus, Science Direct, and Mendeley in their research domain to increase research output and quality.

In the end, user expectations and feedback were discussed where users were satisfied with the DESIDOC library services and services from their respective libraries. They also suggested such awareness programme need to be frequently organised. Dr V Venkateswara Rao, OS & Director, ARDE addressed the gathering in the concluding session. He expressed his satisfaction with the large participation of Pune region laboratories. A Vote of thanks was presented by Shri AR Sarode, TO 'B', ARDE.



## SPECTRUM: UNRAVELLING THE PALETTE OF EMOTIONS

Defence Institute of Psychological Research (DIPR), Delhi organised a five-day course on 'SPECTRUM: Unravelling the Palette of Emotions' during 25-29 April 2022. The course was specially designed for DRTC and Admin & Allied Cadre. The idea behind organising the course was to help people understand the importance of emotional regulation and management both at the personal and work front. A total of 26 participants from DIPR as well as other DRDO laboratories attended the programme.

The programme was inaugurated by Dr K Ramachandran, Director, DIPR.



In his address, he emphasised the importance of emotions, highlighting how emotions are an integral part of human beings. He assured the participants that the programme will be insightful, reflective, and an excellent opportunity for everyone to expand their understanding of emotions.

The course covered wide aspects of emotions like the introduction to hard skills and soft skills, a basic understanding of emotions, embracing emotions, breaking emotional barriers to effective communication, forgiveness, empathy, optimism, emotionally coping with stress, etc.

## COURSE ON MUSHROOM CULTIVATION TECHNOLOGY FOR TROOPS

Skill development/training programme on 'Mushroom Cultivation Technology for Troops' was conducted by Defence Research Laboratory (DRL), Tezpur at HRDC, HQ 4 Corps, Solmara Army Cantt on 27 May 2022. A total of 34 Army personnel (Officers, JCOs, and ORS) attended the training programme. Participants were informed in detail about the types of mushrooms, nutritional benefits, their economic importance as an alternative source of income, and stepwise cultivation technology of mushrooms. The participants were



thoroughly explained the micro points to be remembered during mushroom bag preparation, incubation, and harvesting.

DRL technology booklet and mushroom cultivation technology calendar were distributed to each participant.

## VOCATIONAL/ SUMMER TRAINING-2022

Vocational/Summer Training-2022 for the students of various engineering institutions including IITs and NITs was started on 9 May 2022 after a gap of two years at Integrated Test Range (ITR), Chandipur. In the inaugural function of the training, Shri HK Ratha, Director, ITR welcomed all students and encouraged them for training. The programme has been planned to be carried out in four phases. In its first phase 38 students attended the programme.



## WORKSHOP ON RAJBHASHA HINDI

To promote the progressive use of the official language Hindi, a workshop was organised by the Directorate of Parliamentary Affairs, Rajbhasha & OM (DPARO&M) on 22 April 2022 at DRDO Headquarters. The theme of the workshop was 'Official Language Policy and Implementation' in which Shri Jitendra Kumar, Director (HR), Office of JS & CAO was invited as the Chief Guest. Smt Asha Tripathi, Associate Director, Shri Sujit Kumar Mehta, Assistant Director (OL), and all the nominated officers and employees of the HQ were present in the workshop.

In her address, Smt Tripathi highlighted the importance of Hindi in the age of science and technology. The Chief Guest said that Hindi is not limited only to the office, but it has been noticeably successful in making its presence



on the global stage.

He said that when we work in other languages we have to learn those languages, whereas if we work in our mother tongue we save our time and labour. He shared his experiences of execution of government work in Hindi during

his tenure in different offices.

He provided informative and interesting information about the implementation of the Official Language Policy.

The Vote of thanks was extended by Smt Arunkamal, Assistant Director (OL).

## COURSE ON ADMINISTRATIVE & ACCOUNTING PROCEDURES

As part of Azaadi Ka Amrit Mahotsav, Naval Science & Technological Laboratory (NSTL), Visakhapatnam conducted a course on 'Administrative & Accounting Procedures' during 17-19 May 2022. Dr GV Krishna Kumar, Sc 'G' & Technology Director (MS) briefed about NSTL to the participants. Dr Y Sreenivas Rao, OS & Director, NSTL was the Chief Guest on the occasion. Shri A Raja Rao, SAO-I was the Course Director and Smt P Lakshmi, SAO-II was the Course Coordinator.

Dr Rao told that India is becoming stronger because each



and every organisation in India is mandatorily following the strong administrative and accounting procedures which are mentioned in Indian Constitution. But because of lack of awareness of

these procedures, many activities related to budgeting, accounting, and auditing are being delayed. He appealed all NSTL fraternity to get benefit from this CEP course.

## DESIDOC PARTICIPATION AT CSIR-NISCP R NATIONAL WORKSHOP

Defence Scientific Information & Documentation Centre (DESIDOC), Delhi participated in a national workshop and a training programme organised by CSIR-National Institute of Science Communication and Policy Research (NIScPR), New Delhi during 12 to 18 May 2022. The seven days workshop on 'Hands on Training on Scholarly Publications' was sponsored by SERB-Department of Science and Technology, Govt of India under Accelerate Vigyan Karyashal scheme.

Dr K Nageswara Rao, Director, DESIDOC inaugurated the workshop as Chief Guest. Dr Rao briefed the participants about the appropriate modes and means



to disseminate science to diverse constituents of society at all levels. The inaugural session was concluded and followed by the introductory lecture by Shri R S Jayasomu, Chief scientist and editor, (IJEB), CSIR-NIScPR.

The programme was organised to generate awareness on scholarly communication in science for career growth and to provide young potential researchers an opportunity to develop scientific research skills.

## SPECIAL CAMPAIGN FOR DISPOSAL OF PENDING MATTERS

The government campaign for 'Disposal of Pending Matters & Swachhta initiatives' is taken as a regular process in various government departments. For taking stock of the progress made by DRDO, identifying success stories, and the impact of the initiatives, a campaign was organised during the period from November 2021 to April 2022, 2nd Evaluation of 3rd Party Swachhatta Assessment on SCDPM by a Team from Quality Council of India (QCI) was held on 24 May 2022 at DRDO HQ. The meeting was chaired by Shri Sangam Sinha, OS & Director General (R&M). Shri Sinha explained the impact of the initiatives taken by DRDO. Further, Smt Asha Tripathi, Associate Director, DPARO&M gave a brief introduction to the achievements of the Swachhatta



Campaign during the period. Shri Sanjay Pal, Director, IT & CS, and his team explained the Digital initiatives taken by DRDO through a detailed presentation.

The QCI team along with DRDO Team inspected Conference Hall, O/o DG (R&M), Central Registry, DMS, and Directorates at DRDO HQ. The QCI team also inspected

Kothari Auditorium, Library DRDO HQ, and VIP Lounge.

The QCI team appreciated the arrangements done for maintaining the high standard of cleanliness and initiatives taken by DRDO for digitisation of records and the use of UV-based paper disinfectant in the central registry to follow Covid-19 protocols.

## OBSERVANCE OF ANTI TERRORISM DAY

Anti Terrorism Day was observed at Integrated Test Range (ITR), Chandipur on 20 May 2022 to wean away the youth from terrorism and the cult of violence by highlighting the sufferings of common people and showing how it is prejudicial to the national interest. Every year 21st May is observed as Anti-Terrorism Day. Shri H K Ratha, Director, ITR administered the bilingual Pledge to officers and employees of ITR.



## SEMINAR ON CONTEMPORARY RESEARCH

As part of Azaadi Ka Amrit Mahotsav, Naval Science & Technological Laboratory (NSTL), Visakhapatnam in collaboration with Naval Research Board (NRB), DRDO conducted a seminar on 'Contemporary Research in Naval Sciences & Technologies' on 19 May 2022. Dr BVSS Krishna Kumar, OS & Officiating Director, NSTL was the Chief Guest of the occasion. Prof. P Krishnan Kutty, IIT Madras; Prof. N Prabhu, IIT Bombay; Dr DD Ebenezer, CUSAT, Kochi; Dr CVK Prasada Rao, Senior Scientist (Retired), chaired the seminar as Panel Board members. Dr VBS



Ayyangar, Chief Coordinator gave the welcome address. Shri Krishna Kumar gave a brief on NSTL as the key designer and developer of underwater weapons, with the primary objective of delivering products to the Indian Navy. Shri Ashok Yadav, Sc 'G' &

Member Secretary, NRB explained the role of NRB, its organisational structure, and composition. Prof. Kutty in his keynote address gave an exclusive presentation on the Development of Bio-metric Autonomous Underwater Vehicles (BAUVs) for Marine Surveillance.

## TRAINING-CUM-RSO CERTIFICATION COURSE

Institute of Nuclear Medicine and Allied Sciences (INMAS), Delhi conducted a Training-cum-Radiological Safety Officer (RSO-I) Certification Course on 'Radiation Safety Aspects in Research, Radiotracer and Column Scanning Applications of Ionising Radiations' in collaboration with Radiological Physics and Advisory Division (RP&AD), Bhabha Atomic Research Centre (BARC) and Atomic Energy Regulatory Board (AERB) during 23-31 May 2022. A comprehensive seven days training programme was conducted with the content/syllabus approved by AERB for certification. The faculties from other eminent institutions such as AIIMS, NDMA, and R&R were also invited to deliver practical demonstrations and lectures



during the course. Dr Anil Kumar Mishra, Director, INMAS in his address highlighted the importance of radiation safety in the prevailing geopolitical scenarios and emphasised the 'Atom for Peace' approach of the country to utilise atomic energy for human development.

Dr Ajeet Singh, Scientific Officer, AERB, and Dr D

Sunder, Senior Consultant (Radiological & Nuclear), NDMA represented AERB and BARC respectively for the inauguration of the training programme. The learning assessment and certification were done by an independent examiner committee consisting of BARC and AERB through the written examination followed by a viva-voce.

# RELEASE OF SPECIAL ISSUE OF TECHNOLOGY FOCUS

**S**pecial issue of Technology Focus (June 2022) on 'Broadband EW Antennas and Radomes' was released by Shri N Srinivas Rao, OS & Director, Defence Electronics Research Laboratory (DLRL), Hyderabad in the presence of Dr K Nageswara Rao, Director, DESIDOC, Delhi at DLRL, Hyderabad on 27 May 2022.

The issue presents a comprehensive overview of state-of-the-art broadband EW antennas and radomes that have been developed by DLRL



and successfully installed on a various ground-based, airborne,

shipborne, submarine, and spaceborne platforms.

## APPOINTMENT

### Director, NPOL



Dr K Ajith Kumar, Sc 'G' assumed charge as Director, Naval Physical & Oceanographic Laboratory (NPOL), Kochi,

with effect from 1 June 2022. He holds a B.Tech degree in Mechanical Engineering from the University of Kerala and M.Tech degree in Engineering Mechanics from IIT Madras. He completed his doctoral work in the area of Technology Management at Anna University, Tamil Nadu. He possesses an International Executive Diploma in Project Management, jointly awarded by the International Institute of Projects & Program Management,

India, and George Washington University School of Business, USA.

He joined the DRDO in 1987 as Sc 'B' at NPOL. He has more than 34 years of experience in the design of sonar systems and subsystems for surface, subsurface, and airborne Anti-Submarine Warfare (ASW) applications. He handled various responsibilities as Project Manager, Project Director, Associate Director, and Director (S&T) at NPOL. As Project Director of Maareech, he played a stellar role in developing the system in synergistic collaboration with other R&D labs, academia, and industrial partners, and was instrumental in getting the first indigenous towed array-based sonar inducted by the Indian Navy in multiple numbers.

He is a Fellow of the Institution of Engineers (India), and a member of professional bodies like the

American Society of Mechanical Engineers (ASME), Kerala Management Association (KMA), Institute of Smart Structures & Systems (ISSS), and Indian Society of Systems for Science & Engineering (ISSSE). Presently, he is also a member of the Board of Directors, Kerala State Electronics Development Corporation (KSEDC), Trivandrum, and the Technology Director of Keltron Components, Kerala. He received the DRDO 'Agni Award for Excellence in Self Reliance' for the year 2018 as the leader of Team Maareech. During the induction of Maareech in 2015, he received commendation and a shield from the Hon'ble Raksha Mantri. He also received 'Laboratory Scientist of the Year' award in 2006. He has one product patent to his credit besides more than 20 publications in journals/conferences. He has also published two monographs.



**Young Scientist Award-Telangana Academy of Sciences**

Shri Sharat Chandra Rachuri, Sc 'D' of Defence Metallurgical Research Laboratory (DMRL), Hyderabad has been conferred with the Young Scientist Award-2020 in the field of Engineering Sciences by the Telangana Academy of Sciences. The award, certificate, and citation were presented at a function of the Academy on 30 April 2022. The award was in recognition of his contributions towards the establishment of industrial-scale production of high-strength steel forgings and stampings for use in critical naval applications. The forgings have now been certified, making them available for use in critical applications and thereby removing the country's import dependence.



**D&H Secheron and IT Mirchandani Memorial Award-2021**



The paper titled 'Role of Tool Rotational Speed on Reverted Austenite Formation and its Effect on Mechanical Property of Maraging Steel Friction Stir Welds', by Dr Suresh D Meshram, Sc 'F' and Dr G Madhusudhan Reddy, Director, DMRL, presented in the National Welding Seminar 2020-21 held at Vadodara, was adjudged for D&H Secheron Award-2021 as the best technical paper and IT Mirchandani Memorial Research Award-2021 as the best research paper on welding metallurgy in the National Welding Seminar 2020-21 organised by Indian Institute of Welding, Pune branch on 5 May 2022.

**Fellow of Telangana Academy of Sciences-2020**



Dr A Venugopal Rao, Sc 'G' and Dr P Saravanan, Sc 'F' of Defence Metallurgical Research Laboratory (DMRL), Hyderabad have been elected as 'Fellow of Telangana Academy of Sciences-2020' in recognition of their contributions to science and technology.

**Associate Fellow of Telangana Academy of Sciences-2020**



Dr Sarabjit Singh, Sc 'F' and Dr U Ravi Kiran, Sc 'E' of Defence Metallurgical Research Laboratory (DMRL), Hyderabad have been admitted as 'Associate Fellow of Telangana Academy of Sciences' in recognition of their contributions to science and technology.

# INAUGURATION OF ADVANCED MATERIALS CHARACTERIZATION CENTRE

Defence Research (DMRL), Hyderabad established an Advanced Materials Characterisation Centre (AMCC). The centre was inaugurated by Dr G Satheesh Reddy, Secretary, DD (R&D) & Chairman, DRDO on 18 May 2022 in the presence of Dr SV Kamat, DS & DG (NS&M), DRDO and Dr G Madhusudhan Reddy, OS & Director, DMRL.

The advanced characterisation centre has state-of-the-art facilities such as Aberration Corrected High-Resolution Transmission Electron Microscope (AC-HRTEM), Analytical Transmission Electron Microscope (TEM),



Field Emission Gun Scanning Electron Microscope (FEG-SEM), Field Emission Gun Dual Beam Scanning Electron (FEG-Dual beam) Microscopes, X-ray

Microscope (XRM), Atomic Force Microscopy and Raman Spectroscopy along with different sample preparation techniques.

# COMMISSIONING OF 3-AXES CNC PLASMA CUTTING FACILITY AT ADE

Aeronautical Development Establishment (ADE), Bengaluru has commissioned a new 3-axes CNC plasma cutting facility. This high-definition plasma machine has cutting-edge technology which can cut mild steel, stainless steel, brass, copper, and aluminum alloy materials thicknesses ranging from 1 mm to 50 mm with a proven position accuracy of 0.3 mm. The machine utilises four gases to generate plasma gas, i.e., oxygen, argon, nitrogen, and hydrogen. The Auto CAD drawing can be directly fed to generate the CNC programme, which in turn drives



the plasma torch and cuts the material/component of interest. The machining which takes 5 to 6 days in the conventional machine, can flawlessly be done by this

machine within 30 minutes. The advanced features like auto torch height control, dual-mode operation, etc., make this machine very user-friendly in operation.

## VISITORS TO DRDO LABS

### CAIR, BENGALURU

\* Vice Admiral Sanjay Mahindru, Deputy Chief of Naval Staff and team visited Centre for Artificial Intelligence and Robotics (CAIR), Bengaluru on 6 May 2022. There was a briefing by Dr Subrata Rakshit, Director, CAIR followed by discussion and demonstration of technologies developed by CAIR in the area on Geographic Information System and Command Control Naval Forces.

\* Air Vice Marshal Ajay Shukla and team visited CAIR on 12 May 2022. There was a briefing by Dr Subrata Rakshit, Director, CAIR followed by discussion and demonstration of technologies developed by CAIR.

### DEAL, DEHRADUN

\* Air Vice Marshal Ajay Shukla, VM, ACIDS (ICT), HQ IDS visited Defence Electronics Applications Laboratory (DEAL), Dehradun on 29 April 2022 along with Gp Capt Ajay Singh, Gp Capt Hatinder Singh, Col Sunil Sharma and Cdr Sidharth Rawat. Shri LC Mangal, Director, DEAL briefed him about the activities and projects being pursued at DEAL. Various SDRs including INDE-SDR form factors, Proto and Engineered versions of SDR for fighter aircrafts were showcased along with tropo-scatter communication system, SatCom hub and terminals for satellite-based communication activities. Air Vice Marshal Ajay Shukla appreciated DEAL's contribution in the field of military wireless communication and surveillance technologies.



Vice Admiral Sanjay Mahindru, Deputy Chief of Naval Staff with Dr Subrata Rakshit, Director, CAIR



Air Vice Marshal Ajay Shukla at CAIR, Bengaluru



Air Vice Marshal Ajay Shukla being briefed about DEAL developed products by Sh LC Mangal, Director, DEAL

## DIPR, DELHI

Air Marshal SK Jha, AVSM, Air Officer In-charge Personnel (AOP) visited Defence Institute of Psychological Research (DIPR), Delhi on 12 May 2022. Dr UK Singh, OS & DG (LS) welcomed Air Marshal Jha during his maiden visit to DIPR. Dr K Ramachandran, OS & Director DIPR briefed the research work and assignments being carried out by the institute. He appreciated the research work being under taken by DIPR and commended the Computerized Pilot Selection System (CPSS) for the selection of the pilots in Indian Armed Forces and looked forward for more association.



Air Vice Marshal SK Jha, AVSM, AOP interacting with Dr UK Singh, OS & DG (LS), Dr K Ramachandran, OS & Director, DIPR and senior scientists and service officers

## DMRL, HYDERABAD

\* Hon'ble Member of Parliament (Rajya Sabha) Shri Amarendra Dhari Singh visited Defence Metallurgical Research Laboratory (DMRL), Hyderabad on 16 May 2022. He took a keen interest in DMRL products and technologies and appreciated the work done by DMRL scientists.



Hon'ble Member of Parliament (Rajya Sabha) Shri Amarendra Dhari Singh at DMRL, Hyderabad

\* Dr G Satheesh Reddy, Secretary, DD (R&D) & Chairman, DRDO visited DMRL on 18 May 2022 and interacted with DMRL scientists and reviewed the progress of the work being carried out at the laboratory.



Dr G Satheesh Reddy, Secretary, DD (R&D) & Chairman, DRDO during his visit at DMRL

✧ Air Marshal CR Mohan, AVSM, VSM, SMSO HQ MC, IAF visited DMRL on 5 May 2022. Dr G Madhusudhan Reddy, OS & Director, DMRL presented a brief overview of the laboratory followed by his visit to a few technical groups.

## DRDE, GWALIOR

Maj Gen KV Jauhar, VSM, Additional Directorate General of Army Design Bureau (ADB) visited Defence Research & Development Establishment (DRDE), Gwalior on 19 May 2022. Dr MM Parida, Director, DRDE apprised him about the ongoing R&D activities at DRDE. Dr K Ganesan, Sc 'G' gave a detailed presentation on the technologies and products developed at DRDE. Maj Gen Jauhar appreciated the contribution of DRDE in providing technological solutions for chem.-bio defence and in achieving the self-reliance in NBC defence.

## DRL, TEZPUR

Lt Gen Dinesh Singh Rana, AVSM, YSM, SM, GOC HQ 4 Corps visited Defence Research Laboratory (DRL), Tezpur on 8 June 2022. Dr Dev Vrat Kamboj, Director, DRL briefed him about various R&D activities of the laboratory, primarily to enhance operational efficiency of troops in remote border areas of Northeast India. A comprehensive overview of the on-going research of the laboratory and future plan of work was presented before him. He visited 'Chitramandap'-the DRL Exhibition Hall and was explained about the exhibits of various innovative products & technologies developed by DRL.



Air Marshal CR Mohan, AVSM, VSM, SMSO HQ MC, IAF during his visit at DMRL



Maj Gen KV Jauhar, VSM, Additional Directorate General of ADB in discussion with Director, DRDE and other senior scientists



Lt Gen Dinesh Singh Rana, AVSM, YSM, SM, GOC HQ 4 Corps during his visit at DRL, Tezpur