

DRDO NEWSLETTER

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DRDO Products on display at Aero India 2015





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International Seminar on Aerospace: Vision 2050

DRDO in association with Aeronautical Society of India (AeSI) organised a three-day International Seminar 'Aerospace: Vision 2050' during 16-18 February 2015 at NIMHAS Auditorium, Bengaluru. The main objective of the Seminar, a prelude to the start of the biennial internationally acclaimed air show Aero India, was to dwell and exchange ideas on matters that converge on 'needs of the times' in the ever-emerging realm of aerospace, both military and civil.

Shri Rao Inderjit Singh, hon'ble Raksha Rajya Mantri (RRM), who presided over the inaugural event, recounted the outcomes and achievements of India's Aerospace Technology Plans and its implementation, describing it as 'very rewarding'. He also hailed ISRO's successful Mars Exploration Spacecraft programme including the 'Mars Orbiter Mission' and DRDO's successful test-firing of Agni series of surface-to-surface Intermediate Range Ballistic Missiles (IRBM).

Lauding the recent successful launch of Agni 5, missile with a range of over 5000 km and capable of carrying a warhead of over one tonne, the RRM said: Agni 5 is a major addition to the country's strategic strike capability. Other notable DRDO achievements that found mention in his address included Nirbhay, the indigenously developed sub-sonic long-range cruise missile, Airborne Early Warning and Control (AEW&C) System and Light Combat Aircraft (LCA) Tejas.

In a notable first, the Seminar also had a special theme in its 10th Edition inviting nations to 'Make in India' for mutual benefits through joint ventures. The 'Make in India' economic programme launched by Prime Minister Narendra Modi opens up opportunities for innovative minds to exploit the globally evolving spirit of 'teaming up' and 'pooling resources', said the RRM to an audience comprising over 800 delegates including 15 foreigners. The large-scale economic initiative encompasses infrastructural sectors in aviation, space, defence systems, airport infrastructure, defence engineering, renewable energy and thermal power amongst other civilian sectors.

Earlier, Shri GM Siddeshwara, MoS for Heavy Industries and Public Enterprises, while speaking on the occasion described the various indigenously developed systems in aerospace as symbols of 'Indian Prowess' in the aerospace arena.

Other dignitaries present on the occasion included Dr K Tamilmani, Distinguished Scientist (DS), DG (Aero), DRDO; Shri SK Sharma, CMD Bharat Electronics Limited; Shri T Suvarna Raju, CMD Hindustan Aeronautics Limited; and Dr S Christopher, DS, Programme Director, AEW&C System.

Seminar Souvenir and a special publication on Airworthiness and Certification were also released during the event.

LASTEC develops Optical Target Locater

Laser Science and Technology Centre (LASTEC), Delhi, has designed and developed an Optical Target Locater (OTL), a laser-based portable surveillance device, for detection of passive or active optical threats. The system functions on the cat's eye effect. Any optical system when illuminated by a laser beam returns some back-scattered energy. This retro reflected energy helps in locating optical targets against a static background.

The system is an important tool for detection of any active or passive surveillance



Optical Target Locater

device using the retro reflected signal from their front-end optics. Any surveillance device with front-end optics and a sensor at the focal plane, whether biological, i.e., eye, or passive sensors like binoculars, day sight or night vision device (NVD), or electronic sensors as in Laser Range Finders (LRFs) can be detected by this approach. The threat could be in terms of a sniper equipped with a day sight or a NVD, or any other optical/electro optical surveillance device, viz., binoculars, surveillance cameras, LRF, designators, etc. Two variants of the OTL are being developed.

The development of short range version, OTL 300, for 300 m range has been completed. OTL 1500, the long-range version, is presently undergoing test and optimisation process.

OTL 300 finds application in active scanning and monitoring of specific areas, VIP security and detection of pointed optics. The equipment has been demonstrated to potential users like Delhi Police, National Security Guards and Indian Army and was recently deployed for area sanitisation and security on several occasions. Delhi Police is procuring OTL 300.

GTRE signs MoU with JSC Klimov

Gas Turbine Research Establishment (GTRE), Bengaluru, and JSC Rosoboronexport/JSC Klimov, Russia, entered into a memorandum of understanding (MoU) for joint development of Multi-Axis Thrust Vectoring Nozzle for future generation aero-engine applications.

Dr K Tamilmani, DS, DG (Aero), DRDO and Dr CP Ramanarayanan, OS, Director, GTRE, exchanged MoU with the Russian delegation during Aero India-2015 held in Bengaluru during 19-22 February 2015.



Dr K Tamilmani (right) exchanging MoU with Russian delegation

CEPTAM conducts All India DRDO Entry Test

Centre for Personnel Talent Management (CEPTAM), Delhi, conducted DRDO Entry Test 2014 for DRTC and Admin/Allied Cadre on 1 February 2015 in 25 cities all over India for 929 vacancies for 48 different posts. Around 5.05 lakh candidates appeared in the written examination held in two shifts. Examination was conducted at 387 Centers monitored by about 2470 observers. The examination was successfully organised with the support of various DRDO laboratories and local district administration. OMR-based examination will now be evaluated and shortlisted candidates will be called for skill/ trade tests and interviews.



Students appearing in DRDO Entry Test 2014



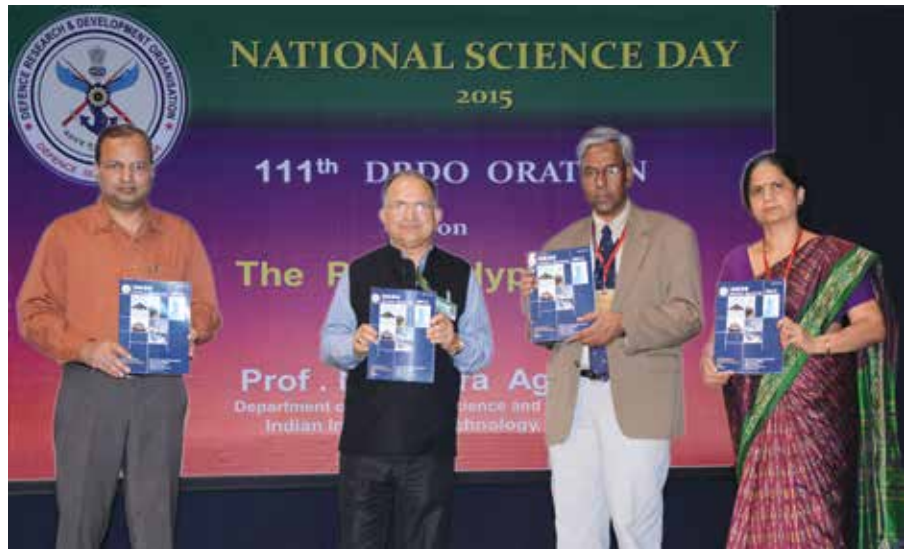
National Science Day Celebrations

28th February is celebrated every year as National Science Day (NSD) in India to mark the discovery of Raman Effect by Sir CV Raman, the great Indian physicist and a Nobel laureate, while working in the laboratory of the Indian Association for the Cultivation of Science, Kolkata. The basic objective for celebration of NSD is to spread the message of importance of science and its application among the people. DRDO HQ and its laboratories/establishments all over the country also celebrated the day to propagate the spirit of science.

DRDO scientists who delivered NSD orations in their respective laboratories/establishments were presented a medallion and an appreciation certificate.

To celebrate NSD, Defence Science Forum (DSF)—a platform to exchange scientific ideas among fellow scientists—organised 111th DRDO Oration on P # NP Hypothesis by Prof. Manindra Agarwal, Department of Computer Science and Engineering, IIT Kanpur, at Dr S Bhagawantham Auditorium, Metcalfe House, Delhi, on 27 February 2015. Dr Sudershan Kumar, DS, Chief Controller R&D (PC & SI), DRDO, presided over the event. The event also included lectures by Shri M Srinivas, Sc C, Naval Science and Technological Laboratory (NSTL), Visakhapatnam, Shri Prashant Kumar Mishra, Sc E, Research Centre Imarat (RCI), Hyderabad and by Dr Pinaki Roychowdhury, Sc F, Defence Terrain Research Laboratory (DTRL), Delhi, on Reduction of Hydrogen Gas Evaluation on Aluminium Anode of Al-AgO Battery by Heat Treatment, Broadband Electromagnetically Coupled Circularly Polarised Antenna Design and on Machines and Thinking: Can they Coexist?, respectively.

DRDO Science Spectrum, a compendium of science day orations, brought out by Defence Scientific Information and Documentation Centre (DESIDOC), Delhi, was also released on the occasion.



Dr Sudershan Kumar (second from left) releasing DRDO Science Spectrum

Shri Sanjay Pal, Sc F, Recruitment and Assessment Centre (RAC), Delhi, and Secretary, DSF, proposed the vote of thanks.

ADE, Bengaluru

Smt Veena G Dixit, Sc F, Aeronautical Development Establishment (ADE) delivered a talk on Satellite-based Navigation System for Automatic Take-off and Landing (ATOL) Unmanned Air Vehicle (UAV).



Smt Veena G Dixit receiving the Oration Certificate from Shri P Srikumar, Director, ADE

DARE, Bengaluru

Dr K Maheswara Reddy, Associate Director, Defence Avionics Research Establishment (DARE)





Dr K Maheswara Reddy delivering NSD Oration

delivered NSD Oration on Detection and Jamming of Low Probability of Intercept (LPI) Radars. The oration covered EW system architecture employing mono-bit and multi-bit digital receivers for detection of LPI radars and the jamming techniques that can be used against such LPI radars.

DESIDOC, Delhi

Shri Nishant Kumar, Sc D, and Shri Anranya Yadav, Sc C, delivered NSD Oration on Upgradation and Optimisation of Web Hosting Infrastructure Architecture for High availability of Web Services. The oration covered upgradation and optimisation of web hosting infrastructure at DESIDOC that helped in achieving uninterrupted and faster availability of web services. As a result availability of DRDO Intranet has been improved substantially with architectural changes and implementation of latest technologies.



Shri Nishant Kumar (left) receiving the Oration Medal from Dr Sudershan Kumar

DIBER, Haldwani

Dr Patade Vikas Yadav, Sc C, Defence Institute of Bio-Energy Research (DIBER), delivered NSD Oration on Stimulated Studies on Economic Cultivation and Harvesting of Locally Adapted Microalgae for Biofuel Production. Shri Piyush Joshi, Sc D, also delivered a lecture on Soft Computing Techniques and its Applications.

DRL, Tezpur

Dr Vanlalhmua, Sc D, Defence Research Laboratory (DRL), delivered NSD Oration on Entomological Warfare: Role of the Six-legged Soldiers. He was presented NSD Medal and Certificate by Dr Vijay Veer, Director, DRL, Tezpur.

GTRE, Bengaluru

Prof. KPJ Reddy, Department of Aero Space Engineering, Indian Institute of Science (IISc), Bengaluru, delivered an invited talk on Magical World of Shock Waves: Putting them to Work. Giving an overview of shock waves and their abilities, he shared many of his discoveries and inventions made in this field. He stressed upon cultivating the habit of simple scientific thought process, which can transcend the society. Occasion also witnessed felicitation to Shri Ritesh Gaur, Sc D, for his contributions towards 3D Conjugate Heat Transfer (CHT) Analysis of Manik Engine's (small turbo fan) High Pressure Turbine Nozzle Guide Vanes. The study has demonstrated the potential of CHT for reducing the expensive and time consuming engine testing.



Shri Ritesh Gaur receiving the NSD Oration Certificate from Dr CP Ramanarayanan (left), Director, GTRE and Prof. Reddy

LRDE, Bengaluru

National Science Day was celebrated in Electronics and Radar Development Establishment (LRDE) on 27 February 2015. Shri SS Nagaraj, Director, LRDE inaugurated the function and brought out the importance of the day. Smt JP Vardhani, Sc F, delivered the NSD Oration on Software Aspects of Airborne Radar.



Smt JP Vardhani receiving Oration Certificate from Dr DC Pande

MTRDC, Bengaluru

Smt P Durga Devi, Sc D, delivered NSD Oration on Overview of Materials and Processes in Microwave Tubes. Dr SN Joshi, Emeritus Scientist, CSIR-CEERI, Pilani, was the Chief Guest on this occasion.



Smt P Durga Devi receiving Oration Certificate from Dr Lalit Kumar, Director, MTRDC

RCI, Hyderabad

Research Centre Imarat (RCI), Hyderabad, celebrated NSD on 4 March 2015. Dr CH Mohan Rao,

Director, Centre for Cellular and Molecular Biology (CCMB), Hyderabad, was the Chief Guest on the occasion. Dr SB Gadgil, OS, Associated Director, RCI, in his welcome address highlighted the importance of NSD. Shri P Krishna Menon, Sc C, delivered NSD Oration on Bio-inspired Technologies. Dr CH Mohan Rao in his address urged scientists to take fruits of science and technology nearer to all sections of society.



Dr CH Mohan Rao lighting the lamp at RCI NSD function

R&DE (E), Pune

Dr Surendra Pal, Vice Chancellor, Defence Institute of Advanced Technology (DIAT), Pune, was the Chief Guest of the NSD function. Dr S Guruprasad, OS, Director, R&DE(E), spoke about the importance of Sir CV Raman's contributions and the importance of cultivating scientific temperament. Dr Surendra Pal delivered a lecture on Indian Aerospace Paradigm and Research Opportunities. Shri Paras Ram, Sc C, gave NSD Oration on Development of Ejection System for Aircraft-based Launcher.



Dr S Guruprasad, Director, R&DE (E), felicitating Dr Surendra Pal

SAG, Delhi

Dr G Athithan, OS, Director, Scientific Analysis Group (SAG), highlighted the importance of the Science Day and listed out a number of biographical books on famous scientists indicating that one should read these books to gain inspiration for scientific research. NSD Oration was delivered by Shri Arvind Kumar, Sc C, on Related Key Attacks on Block Cipher. He briefly described the concept of related key attacks on block cipher, its application on LOKI block cipher and other areas where the related key attack could be applied. He also gave a demo on the related key attack implemented by him on LOKI cipher.



Dr G Athithan (left) presenting memento to Shri Arvind Kumar

SASE, Chandigarh

Dr RS Khandpur, former Director General, Pushpa Gujral Science City, Kapurthala, was the Chief Guest on the NSD celebrated at Snow and Avalanche Study

Establishment (SASE). He delivered an interesting presentation on Science Education and Research: The Way Forward in which he emphasised that creativity, innovation and design need promotion in the country to fulfill dream of 'Make in India'. Dr JC Kapil, Sc D, presented an interesting talk on Raman Effect and its Applications. Shri Dan Singh, Sc D, presented NSD Oration on Analogue Weather Forecasting: Opportunities and Challenges. He discussed the advantages and disadvantages of the technique in current scenario, especially in a terrain like Western Himalaya.

A booklet entitled Long Period Average (LPA): 1990-2010 of Winter Precipitation for selected meteorological stations over Western Himalaya was also released by the Chief Guest and Shri Ashwagosh Ganju, Director, SASE.



Shri Ashwagosh Ganju presenting the achievements of SASE

VRDE participates in Bhartiya Vigyan Sammelan and SIAT Expo-2015

Vehicles Research and Development Establishment (VRDE), Ahmednagar, participated in the 4th Bhartiya Vigyan Sammelan and Expo, organised by Vijnana Bharti (VIBHA) in association with Goa University, Panji, and Government of Goa during 5-8 February 2015. Shri Manohar Parrikar, Hon'ble Raksha Mantri, inaugurated the Sammelan. VRDE displayed Chemical, Biological, Radiological, Nuclear (CBRN) Mini Unmanned Ground Vehicle (UGV), scaled model of Armoured Amphibious Dozer (AAD) and information on VRDE products and activities including that of National Centre for Automotive testing (NCAT). Students from Goa showed keen interest in the VRDE products and infrastructure.



Shri Manohar Parrikar being briefed about CBRN UGV by Col Piyush Agarwal in Bhartiya Vigyan Expo

Raising Day Celebrations

INMAS, Delhi

Institute of Nuclear Medicine and Allied Sciences (INMAS), Delhi, celebrated its 54th Annual Day on 13 February 2015. Lt Gen MK Unni, AVSM, VSM Commandant, Army Hospital (R&R), Delhi and Colonel Commandant was the Chief Guest and Prof. Manas K Mandal, DS, DG (LS), DRDO, was the Guest of Honour on the occasion. The function marked the culmination of several scientific, societal, cultural, and sports activities held at INMAS. Dr RP Tripathi, OS, Director, INMAS, welcomed the guests and appreciated the scientific and societal contributions made by the INMAS, particularly in the areas of CBRN training, non-invasive imaging as well as radiation biology.

Lt Gen Unni, in his address, said that INMAS has become a prime Institute, not just for the armed forces but also for the nation, where it is possible to conduct a variety of multidisciplinary research in several areas of advanced biomedical research jointly with the expertise available with armed forces.

Prof. Manas K Mandal expressed his happiness that prospectively INMAS will be shouldering the additional responsibility of training medical and Armed forces personnel in the area of CBRN defence. The Chief Guest presented various DRDO Laboratory-level Awards and Cash Awards to meritorious employees of INMAS for their outstanding contributions.



Dr Rajeev Vij receiving the Technology Group Award

Fun/team building games were organised by professional event managers for INMAS employees and their families. A never to forget scintillating exhibition of marshal arts by professional marshal art artists from Manipur and five surprise prizes for audience through lucky draw were the other attractions of the day. A colourful cultural programme was also presented by the team INMAS. Dr Rajeev Vij, Sc F, Chairman, Annual Day Celebrations Committee, proposed the vote of thanks.

R&DE (E), Pune

Research and Development Establishment (Engineers) [R&DE(E)], Pune, celebrated its 53rd Annual Day on 9 February 2015. Lt Gen AT Parnaik, AVSM, SM, VSM, Commandant, College of Military Engineering, Pune and Colonel Commandant, Bengal Sappers and Military Survey was the Chief Guest on the occasion. As a part of the Annual Day celebrations, Gen Parnaik also delivered Aga Memorial Lecture in honour of Brig Aga, AVSM, founder Director of R&DE(E). He shared his thoughts on Engineering Challenges in Himalayan Region.

Annual Day sports were organised during the week and prizes were distributed to the winners of the various sports competitions. Dr S Guruprasad, OS, Director, R&DE(E), gave away DRDO Laboratory-level Awards and Cash Awards to the meritorious employees. Mementos were also given to employees who completed 25 years of service in DRDO. A colourful cultural programme was presented by the employees of the establishment.



Dr S Guruprasad inaugurating Annual Day Sports

Manpower Development Activities

Conferences/Seminars/Symposia/Training Courses/Meetings

Workshop on Rock Fall Simulation Model and Debris Flow Calculations

Defence Terrain Research Laboratory (DTRL), Delhi, organised a one-day training workshop on Rock Fall Simulation Model and Debris Flow Calculations on 4 February 2015. Dr Perry Bartelt, Dr Yves Bühler Christoph Balg representing Geobruigg India, conducted the workshop using Rapid Mass Movement Simulation software. Scientists from Snow and Avalanche Study Establishment (SASE), Chandigarh; National Institute of Disaster Management (NIDM), Delhi; National Disaster Management Authority (NDMA); Geological Survey of India (GSI), Kolkata; AIMIL Ltd; Department of Geography and Geology, Delhi University; GEOBRUGG; Indian Institute of Remote Sensing (IIRS), Dehradun; and DTRL participated in the workshop.

Dr MR Bhutyani, Director, DTRL, in his welcome address, highlighted the work done in DTRL in the field of landslide and various aspects of their prediction and modelling. Workshop was aimed to share the knowledge in modelling and prediction of landslides in Switzerland. Dr Perry discussed the mechanics of rockfall and Dr Buhler highlighted landslide mechanics modelling using RAMMS software to simulate natural hazard. Christoph Balg shared his expertise on mitigation strategies of rockfalls and landslides in Switzerland and measures to be implemented in landslide zone of Vaishno Devi temple in Katra, Jammu.

National Seminar on Landslides Management and Mitigation Strategies

As a part of its Golden Jubilee Celebrations, **DTRL** organised a national seminar on Landslides: Management and Mitigation Strategies (LAMAMIS) during 5-6 February 2015. Dr Shailesh Nayak, Secretary, Ministry of Earth Sciences, inaugurated the seminar. Dr MR Bhutyani, Director, DTRL, welcomed the dignitaries and the participants and discussed the work done in the field of landslides by DTRL. Shri Sunil Dhar, Convener of LAMAMIS, gave an overview of the

seminar and its objectives. The seminar, among others was also attended by Dr RK Bhandari, Chairman, Forum on Engineering Intervention in Disaster Mitigation; Prof. Santosh Kumar, Executive Director, National Institute of Disaster Management (NIDM). Dr Manas K Mandal DS, DG R&D (Life Science), DRDO, gave the keynote address on Psychological Aspect of Disaster and their Effective Management.

Around 200 participants from various DRDO labs/estts and government organisations, universities and industries attended the seminar. Forty-five research papers, covering a wide range of topics on monitoring and early warning, hazard mapping, vulnerability and risk assessment, and mitigation, preparedness and recovery, etc., were presented.

CEP on Resource Management

Defence Metallurgical Research Laboratory (DMRL), Hyderabad, organised a course on Resource Management under DRDO's Continuing Education Programme (CEP). The objective of the course was to enhance the awareness of the participants in various support activities related to the functioning of the DRDO laboratories. Dr Ashok Gogia, OS, DMRL, inaugurated the course. Dr T Raghu, Sc G and Course Coordinator, welcomed the participants and explained the importance of CEP courses in DRDO. The course contained lectures on Human Resources, Information



Dr Hina Gokhale, Director, HRD, DRDO HQ, delivering talk on HR Management in DRDO



Management, Computational Resources, Finance, Budget, Procurement, IT, etc., by faculty from DRDO HQ, DRDO labs as well as external agencies. Thirty-two officers attended the course. Dr Amol Gokhale, DS, Director, DMRL, in his valedictory speech, urged upon the participants to utilise the information gained.

CEP on Characterisation of Mechanical behaviour of Materials

A CEP course on Characterisation of Mechanical behaviour of Materials was conducted by **DMRL**, Hyderabad during 16-20 February 2015. A total of 34 participants from DMRL, DRDL, ARDE and HEMRL attended the course. The course primarily covered various characterisation techniques such as tensile and impact testing of metallic materials, creep deformation, mechanical behaviour of materials at small length scale, low cycle fatigue (LCF) and high cycle fatigue (HCF) behaviour of metallic materials, etc. Advanced topics such as characterisation of fracture behaviour of metallic materials, creep life prediction methodologies, and practical aspects such as application of evaluated mechanical properties for designing actual components, etc., were also covered. Laboratory visits to all the test facilities in DMRL were conducted to enable the participants to have a practical glimpse on various testing methods, to understand the precautions to be taken while testing to avoid erroneous output and to have exposure of latest characterisation facilities.



Dr N Eswara Prasad, Regional Director, RCMA (Materials) delivering the keynote address

Audit Conference

Institute of Nuclear Medicine and Allied Sciences (INMAS), Delhi, conducted a one-day Audit Conference

on 27 February 2015. The purpose of holding the conference was on the spot settlement of audit objections/observations after verification of documents and also to train the DRDO officers/staff dealing with audit related issues. Dr Rajeev Vij, Sc F, welcomed the participants. Shri Upendra Sah, IDAS, Principal Controller of Defence Accounts (R&D), inaugurated the workshop and explained the importance and need for timely settlement of audit observations and objections. He also gave tips for future compliance to the participants.

Ms Rita Garg, Deputy Controller of Defence Accounts (DCDA) and Shri Rajeev Ranjan Kumar, DCDA (R&D) also addressed the participants. Many senior officers from the Offices of PCDA, DCDA and LAO were present to guide and solve audit-related problems related to audit. Sixty-eight persons, dealing audit objections and observations in their respective Delhi-based DRDO labs/estts, attended the proceedings. The participants came along with the related documents required for verification and on the spot settlement of audit objections. Most of the LAO objections were settled on the spot by PCDA and his team.



Proceedings of the Audit Conference in progress

Brain Storming on High Power Fibre Laser

A one-day brain storming session on High Power Fibre Laser was conducted by **Laser Science and Technology Centre (LASTEC)**, Delhi, on 12 February 2015 under the Chairmanship of Shri SS Sundaram, DS, DG (ECS), DRDO. Dr Satish Kumar, DS, Chief Controller R&D (TM), DRDO, co-chaired the proceedings. The national-level event aimed to identify various research groups for indigenous development of critical components and technologies for multi kilowatt Continuous Wave/Pulsed Fibre Lasers. The participants





Brain storming session in progress

included scientists from DRDO, professors from various IITs, IISc Bengaluru, Central Glass and Ceramic Research Institute (CGCRI), Kolkata, BEL, Pune, etc. The event was divided into three technical sessions on requirements of DRDO, technologies and components and ended with a panel discussion to finalise strategies of working in a consortium.

Director, RCI, was the Chief Guest of the inaugural programme. In his inaugural address he stressed upon effective implementation of Hindi in all areas of Defence R&D.

Dr Reddy also released Seminar Proceedings and RCI Hindi magazine, Imarat 2015, on this occasion.

All India Rajbhasha S&T Seminar

Research Centre Imarat (RCI), DRDL, DMRL, DLRL, ASL, ANURAG, CHES, RCMA (Missiles) and RCMA (Materials) jointly organised 10th All India Rajbhasha S&T Seminar during 12-13 February 2015 at RCI, Hyderabad. The theme of the seminar was Defence R&D Laboratories: Advancing Towards Modernisation in Technological Developments. Dr G Satheesh Reddy, DS,



Dr G Satheesh Reddy (fourth from left) releasing RCI Hindi Magazine Imarat 2015

ISO 9001:2008 Certification for LASTEC

Laser Science and Technology Centre (LASTEC), Delhi, a centre of excellence for the development of high power laser sources and related technologies, electro-optic countermeasure equipment and battlefield optoelectronic systems, has been certified ISO 9001:2008 Compliant Centre by Intertek Certification Limited, a United Kingdom Accreditation Service accredit

body under schedule of accreditation no. 014. The quality management system is applicable to development of high power laser sources, electro-optic countermeasures, opto electronic system and technologies for different applications and advanced research in the field of lasers, photonics and opto electronics. The certificate is valid up to 3 February 2018.

Personnel News

Appointment

Director, NPOL, Kochi



Shri S Kedarnath Shenoy, Sc G, has taken over as Director, Naval Physical and Oceanographic Laboratory (NPOL), Kochi, on 1 March 2015. He holds MSc degree in Physics with specialisation in Electronics from University of Kerala and MTech in Computer Science from IIT, Bombay. He also did one-year Advanced Training Course in Nuclear Science and Engineering from BARC Training School, Trombay. In 1983, he joined the Reactor Control Division, BARC, as Scientific Officer C and worked on the development of a Metallographic Image Analysis System. In 1984, Shri Shenoy joined DRDO as Sc B at NPOL, Kochi. In 1986 he did three-month training programme in advanced software engineering methodologies at Carnegie Mellon University and Indus Tech at Pittsburgh, USA.

At NPOL, Shri Shenoy has handled various responsibilities as Project Manager, Division Head, Group Head and Project Director and has contributed to a number of projects and technology development programmes such as Action Speed Tactical Trainer, Modular Data Bus, Weapon Computer for the indigenous Light Combat Aircraft Tejas, Hull Mounted Sonar System-HUMSA NG for Naval warships, and various other sonar systems and technologies for ship, submarine and airborne platforms. Before taking over as Director, he served as Associate Director in-charge of Electronics Groups leading a team of over 100 scientists and engineers comprising five divisions including signal conditioning, power electronics, signal processing and embedded computer hardware and software for Sonar systems. He was also supervising the Hull Mounted Sonar projects of NPOL.

He is the recipient of the VASVIK Award in Electronics for the year 1990 for his contributions to the development of an indigenous fiber optic data bus system for warships of the Indian Navy. As Project Director, the team under his leadership was awarded DRDO Performance Excellence Award for the year 2010 by the then hon'ble Raksha Mantri Shri AK Antony

for the successful development of HUMSA-NG sonar system which is installed on the latest frigates of the Indian Navy and being fitted on many other Naval Ships. He has also received a number of awards at the laboratory level including the Laboratory Scientist of the Year Award 2008.

Awards

Bioved honours to DIBER Scientists

Dr M Nasim, OS, Director, Defence Institute of Bio-Energy Research (DIBER), Haldwani, has been awarded Bioved Honorary Fellowship for crop improvement and dissemination of technologies especially to remote regions, which are conventionally considered unsuitable for agriculture in the 17th Indian Agricultural Scientist and Farmers' Congress on Agri-Innovation for Enhancing Production and Rural Employment held during 21-22 February 2015 at Bioved Research Institute of Agriculture and Technology, Sringeripur, Allahabad.

Dr HK Pandey, Sc D, DIBER, was also awarded Agri-Innovation Award, for his contributions in developing Lukoskin ointment and oral dose for Leucoderma. Ms Seema Singh, SRF, also won best poster award during the event.

Fellow of National Academy of Engineering



Dr Lalit Kumar, OS, Director, Microwave Tubes Research and Development Centre (MTRDC), Bengaluru has been elected Life Fellow of National Academy of Engineering wef from January 2015.

Aerospace and Defence Award-2015

NPOL, Kochi, bagged Aerospace and Defence Awards-2015 for outstanding contributions in naval systems during the Aerospace and Defence Awards-2015 function held on the sidelines of the Aero India-2015 on 17 February 2015. The event was organised by SAP Media Worldwide Ltd, International Review and Analysis and Show Daily. Shri S Anantha Narayanan, DS, Director, NPOL, received the award from Dr K Tamilmani, DS, DG (Aero), DRDO.



Shri Anantha Narayanan (second from left) receiving the award

Higher Qualification Achieved

DLRL, Hyderabad

Shri Arun Kumar Singh, Sc F, Defence Electronics Research Laboratory (DLRL), Hyderabad, has been



HEMRL, Pune



awarded PhD degree by the Osmania University, Hyderabad for the thesis entitled Real Time Identification of Intra-pulse Modulation of Radar Signal by Time Frequency Analysis.

Shri Kshirsagar Dharendra Ramrav, TO B, High Energy Materials Research Laboratory (HEMRL), Pune, has been awarded PhD degree by the Savitribai Phule Pune University for the thesis entitled Studies on Mechanical, Thermal and Ballistic Properties of Composite Propellant formulation using Nanoparticles of different Transition Metal Oxides.

Sports Round-up

CVRDE organised Cycle Rally

The adventure club of Combat Vehicles Research and Development Establishment (CVRDE), Chennai, organised a Cycle Rally to Melmaruvathur Educational Trust (100 km from Avadi) during 9-13 February 2015 to create awareness about the products developed by DRDO for the defence forces and to propagate government's initiative on Swachh Bharat to general public and also to visit various educational institutions en-route to make the students aware of the research and employment opportunities in DRDO.

Dr P Sivakumar, OS, Director, CVRDE, flagged off the rally. About 45 participants from NPOL, Kochi, ASL and DRDL, Hyderabad, VRDE, Ahmednagar, LRDE, Bengaluru and CVRDE participated in the rally.

The rally team visited BS Abdur Rehman University, Vandalur; St. Joseph School, Chengelpet; Adhiparasakthi Engineering College and Adhiparasakthi Polytechnic College en-route to Melmaruvathur. The team gave detailed presentation on products developed



Dr P Sivakumar (forefront) at flagging off ceremony

by DRDO with video presentation. Models of Arjun MBT, Carrier Command Post Track (CCPT) Vehicle and Light Combat Aircraft (LCA) were demonstrated along with presentation of posters.

On return, the rally team visited ASAN Memorial College of Engineering and Technology, Thirukazhukundram and Prathyusha College, Thiruvallur. A large number of students visited demonstration and presentation of DRDO products. The team explained the benefits of the Swachh Bharat Abhiyan to the general public during the course of entire cycle rally.



डीआरडीओ न्यूज़लैटर

Visitors to DRDO Labs/Estts

CAIR, Bengaluru

A US delegation led by Mr Alan Shaffer, Principal Deputy Assistant Secretary of Defence (R&E), visited Centre for Artificial Intelligence and Robotics (CAIR) on 20 February 2015 for technical discussions.

DARE, Bengaluru

Lt Gen CA Krishnan, UYSM, AVSM, DCOAS (P&S), visited Defence Avionics Research Establishment (DARE), on 22 January 2015. He was briefed on various products and technologies designed and developed by DARE.



Lt Gen Krishnan being briefed about DARE products

DMRL, Hyderabad

A US delegation led by Mr Alan Shaffer, Principal Deputy Assistant Secretary of Defence (R&E), visited Defence Metallurgical Research Laboratory (DMRL) on 27 February 2015.



US delegation being briefed about DMRL products

GTRE, Bengaluru

Shri G Mohan Kumar, IAS, Secretary Defence Production, visited Gas Turbine Research Establishment, (GTRE), on 5 March 2015.



Shri Mohan Kumar being briefed about engine components

INMAS, Delhi

Surgeon Vice Admiral Tapan Sinha, SM, DGMS (Navy), visited Institute of Nuclear Medicine and Allied Sciences (INMAS) on 27 February 2015. Dr RP Tripathi, OS, Director, INMAS, apprised the visitor about products development activities of INMAS.



Surgeon Vice Admiral Tapan Sinha being briefed about foldable stretcher developed by INMAS

LASTEC, Delhi

A US delegation visited Laser Science and Technology Centre (LASTEC) on 25 February 2015 to discuss areas of Indo-US collaborations to develop new technologies.

LRDE, Bengaluru

Air Marshal SS Soman, PVSM, AVSM, VM, ADC, AOC-in-C, HQ WAC, visited Electronics and Radar Development Establishment (LRDE) on 6 February 2015. Shri SS Nagaraj, Director, LRDE, made presentation on LRDE projects.

