

DRDO NEWSLETTER

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DRDO bags Best Pavilion Award in India-International Science Festival 2015

From the Editor in Chief...



I am just about half way through of my first year as Director DESIDOC and thought the end of the year is a good time to reflect on where we and the *DRDO Newsletter* have been and where we are going. It is therefore with great pleasure and sense of responsibility that I write today as the Editor-in-Chief of the *Newsletter*.

Serving as Director has given me some insight into what it takes to publish a magazine or a journal—motivated individuals and team work; and, I put on record my appreciation for the excellent team effort encompassing DRDO labs, editorial team and honest readership that has made *DRDO Newsletter* a hugely popular in-house magazine. The editorial team and all those involved are determined to maintain and enhance the status of the magazine and its position. To that extent our readers will also note that the editorial handling process and consequently the turnaround of the magazine have been speed up over the past six months. The magazine is now more than ever punctual.

DRDO Newsletter has completed 35 years in 2015 and grown from a bimonthly four-page leaflet to a full-fledged monthly magazine. As I look to the year ahead, I reiterate with confidence that DESIDOC will continue to serve with even greater enthusiasm and dedication. In the year 2016 we have planned to re-organise the magazine by introducing new S&T features and adopting a new, easier-to-read format by adapting to e-publication. Success depends on equal partnership. I promise to improve and promote our role in this partnership, which I believe can only be achieved with the continued cooperation of our contributors and valued readership. Your active participation is greatly appreciated.

In closing I wish DRDO community and all our readers the very best wishes for 2016 and assure that DESIDOC is now moving forward to new standards of excellence.

Sincerely

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Director, DESIDOC

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Cover: Shri Hari Babu Srivastava (extreme left), OS and Director, LASTEC, Delhi, receiving the Best Pavilion Award from Dr Harsh Vardhan, Hon'ble Union Minister of Science and Technology and Earth Sciences.

IN THIS ISSUE

DRDO bags Best Pavilion Award in India-International Science Festival 2015 **4**



National Workshop on Disaster Management **5**



Raksha Mantri inaugurates Universal Pilot Plant at HEMRL **6**

Dr Christopher inaugurates Information Centre for Armament Technology **6**

ToT of Radiological Decontamination Skin Wipe REMOCON **7**

Biological Aerosol Test Facility established at DRDE **7**

Raising Day Celebrations **8**

Manpower Development Activities **10**

Personnel News **13**

Kaumi Ekta Saptah **17**

Karnataka Rajyotsava **17**

Vigilance Awareness Week **18**

Sports Round-up **18**

Visitors to DRDO Labs/Estts **19**

DRDO bags Best Pavilion Award in India-International Science Festival 2015



Shri Hari Babu Srivastava with team DRDO

DRDO won the Best Pavilion Award in the Mega Science, Technology and Industry Expo organised by the Department of Science and Technology and Department of Earth Sciences, Government of India during India-International Science Festival 2015. A jury of senior members of Vijnan Bharati judged DRDO's pavilion as best pavilion based on the design, exhibits, response of visitors and the quality of explanations provided by the exhibitors. On behalf of DRDO, Shri Hari Babu Srivastava, OS and Director, Laser Science and Technology Centre (LASTEC), Delhi, received the Award from Dr Harsh Vardhan, Hon'ble Union Minister of Science and Technology and Earth Sciences on 7 December 2015.

Twelve labs/estts of DRDO, viz., Centre for Airborne System (CABS) and Electronics Research and Development Establishment (LRDE), both in Bengaluru; Instruments Research and Development Establishment (IRDE) and Defence Electronics Applications Laboratory (DEAL), both in Dehradun; Armament Research and Development Establishment (ARDE), Pune; Defence Research and Development Laboratory (DRDL), Hyderabad; LASTEC; Centre for Fire, Environment and Explosives Safety (CFEES); Institute of Nuclear Medicine and Allied Sciences (INMAS); and Solid State Physical

Laboratory (SSPL), all in Delhi; Vehicle Research and Development Establishment (VRDE), Ahmednagar; and Naval Physical Oceanographic Laboratory (NPOL), Kochi showcased their technologies and products in the Science Festival. Other prominent participants include Brahmos Aerospace, CSIR, DAE, ICMR, TIFAC, Inter-University Accelerator Centre, Ministry of Earth Sciences, Survey of India, BEL, BDL, Technology Development Board, Indian Institute of Astrophysics, IIT Indore and Delhi, Bose Institute, Aryabhata Research Institute of Observational Science, Birbal Sahani Institute of Palaeobotany, and a large number of State Government scientific organizations and private entities.

Some important DRDO products displayed in the Expo include fire safety chute, remotely piloted vehicle for detection of chemical, biological and radiological agents, crowd control dazzler, thermal imaging camera, image intensifier-based night vision devices, optical target locator, explosive identifier 'Pre-emptor', hydrophone, etc.

The event was hosted by IIT Delhi during 4-8 December 2015. Around 2 lakh visitors visited the exhibition. DRDO pavilion was the star attraction of the exhibition with overwhelming crowds of students keen to understand military technologies.

National Workshop on Disaster Management

DRDO organised National Workshop on Disaster Management on 28 November 2015 to showcase technologies and products developed indigenously by the organisation for disaster management. Dr PK Mishra, Additional Principal Secretary to the Prime Minister inaugurated the workshop in the presence of Dr S Christopher, Secretary Department of Defence R&D and DG, DRDO.

Speaking on the occasion Dr PK Mishra said, India has been hit by disasters, both man-made and natural, frequently and the steps taken and lessons learnt from the past should be utilised and made sustainable by using better innovations. "In the past the approach to disaster management was mostly relief centric but now we have to think differently and must delve more on the process of mitigation and preparedness for any kind of eventuality," said Dr Mishra. Delving on the present day situation, Dr Mishra said that apart from natural calamities cyber disasters are the new threats and that is where DRDO and other stakeholders can contribute immensely. He complimented DRDO for its innovations and training efforts towards disaster management.

Dr S Christopher, in his keynote address, said natural hazards affects nearly six per cent of India's population and 24 per cent of deaths in Asia are caused by disasters. Elaborating on the contributions of DRDO in disaster management, Dr Christopher said, "DRDO has developed several technologies, as an offshoot of defence research, which find useful applications in disaster management." He also reiterated that the organisation will continue to be in the technological development and support mode to save precious human lives.



DRDO has in the past contributed to the various disaster management operations like Tsunami in 2004, Uttarakhand flash floods in 2013 and J&K floods in 2014. Besides these, post event trauma management during tsunami was also conducted by the organisation. As DRDO is developing many state-of-the-art technologies, some of these can be adopted for future disaster management solutions.

To showcase the products and technologies, an exhibition was also organised where 11 DRDO laboratories exhibited their products. These products and technologies are readily available with the industry partners.

Panel discussions were also conducted with the objective to define trajectory of developmental activities of DRDO for future technological solutions to assist risk mitigation and preparedness against disasters. National Disaster Management Agency (NDMA), National Disaster Response Force (NDRF), Ministry of Home Affairs, Armed Forces, Central Reserve Police Force, Central Industrial Security Force, National Security Guards, and others participated in the workshop. Several industrial partners also participated in the workshop.

Raksha Mantri inaugurates Universal Pilot Plant at HEMRL

Raksha Mantri Shri Manohar Parrikar inaugurated the Universal Pilot Plant (UPP) at High Energy Materials Research Laboratory (HEMRL), Pune, on 19 November 2015. Dr S Christopher, Secretary Department of Defence R&D and DG, DRDO, was also present on the occasion.

UPP Facility is a state-of-the-art environment friendly chemical pilot plant used for the development of advanced high energy materials required for various armament and missile systems. The plant will be used for scaling up lab-level futuristic high energy materials. It will also be utilised for establishing the complex chemical processes for production. The plant is fully automatic and process parameters are controlled through PLC and SCADA-based control system. UPP is suitable for processing or development of high performance futuristic High Energy Materials ranging from milligram to 20 kg batch levels.

Raksha Mantri also visited Vehicle Research and Development Establishment (VRDE), Ahmednagar, and



witnessed the static demonstration of Agni Road Mobile Launcher, Unit repair Vehicle and Unit Maintenance Vehicle for MBT Arjun, NBC Recce Vehicle, Rotary Engine for Unmanned Aerial Vehicle, Nishant, and live demonstration of CBRN Mini Unmanned Ground Vehicle, Armoured Amphibious Dozer and live testing of vehicles at EMI/EMC Test Facility.

Dr Christopher inaugurates Information Centre for Armament Technology

Dr S Christopher, Secretary, Department of Defence R&D and DG (DRDO) inaugurated information Centre for Armament Technology at Armament Research and Development Establishment (ARDE), Pune on 27 October 2015.

ICAT will provide vast reading space in an ambient air-conditioned environment. Its two floors comprise technical discussion room, study carrels for independent research studies, huge halls for exhibitions and extension activities, and an interactive global digital classroom. The facility will offer its users a strong IT infrastructure for enhanced information services through Intranet and Internet, with a dedicated server room hosting the domain/web server, digital database server for DSpace, bibliographic database server for Libsys, and the National Knowledge Network (NKN) server. A new attraction will be Kindle E-Book readers enabling users



to access a treasure-house of technical literature in digital format.

ICAT Building will also house Human Resources Development Division with a view to facilitate training programmes with easy access to the knowledge base of TIRC/ICAT.

ToT of Radiological Decontamination Skin Wipe REMOCON

Institute of Nuclear Medicine and Applied Sciences (INMAS), Delhi, transferred the patented technology of 'REMOCON' Skin Wipe for radiological decontamination to M/s Novel Tissue Pvt Ltd, Mysore. Dr AK Singh, OS and Director INMAS, exchanged the ToT documents with Shri AB Dodamani, President, M/s Novel Tissue Pvt Ltd.

Self-usable 'REMOCON' skin decontamination wipe, can be used in the mass casualty events resulting from Nuclear and Radiological Emergencies. 'REMOCON' wipe can be sealed back after use in the innovatively designed metal-free package. This ensures easy disposal after its usage to prevent spread of radioactive contamination. Accidental or intentional release of toxic radiological materials may cause external contamination of skin. Lengthy and time consuming procedure for removal of the radio-contaminants from skin could result in deleterious health effects.

Availability of clean water free from radio-contaminants during such scenario is another important



Dr AK Singh exchanging ToT documents with Shri AB Dodamani

limiting factor for effective and timely decontamination. 'REMOCON' wipe takes care of both these issues as it is self usable, saves precious times and reduces generation of hazardous radioactive waste. The active constituents of 'REMOCON' could effectively remove most of the toxic radio-nuclides, is skin safe and have unique ability to adhere to the localized area on skin.

Biological Aerosol Test Facility established at DRDE

Generic biological sensors are available to monitor the bioaerosol round the clock. But the country lacks the facility to test and evaluate the performance of such commercially off-the-shelf (COTS) biological sensors with respect to their limit of detection, response time, sensitivity, specificity, false alarm rate, etc. Defence Research and Development Establishment (DRDE), Gwalior, has designed, developed and commissioned a Biological Aerosol Test Facility (BATF) for testing biological point detectors. The test facility is fitted with a damper to adjust wind velocity. It also comprises humidity and temperature probes for simulation and assessment of outdoor weather conditions. A particle counter is also connected with the test chamber to characterize the aerosol particles inside the test chamber.



The test chamber is designed to test biological warfare stimulants representing different pathogenic microorganisms and toxins. In addition, many common materials such as smoke and diesel exhaust, which interfere with the detection of the biological warfare agents, can also be tested.

The chamber can be used with materials in both vapour and aerosol form.

It is a closed system and the aerosol can be cleared from it within minutes after decontamination. The test chamber has provision for UV decontamination, physical decontamination (incineration) and chemical decontamination.

Raising Day Celebrations

Defence Scientific Information & Documentation Centre

Defence Scientific Information and Documentation Centre (DESIDOC), Delhi, celebrated its 46th Raising Day on 20 November 2015. Dr RK Chadha, former Librarian, Parliament Library, and Shri Rajesh Agarwal, motivational speaker, were the Raising Day speakers.

On the occasion the message of DS and CC R&D (HR) was read in which he appreciated the role of DESIDOC as a highly specialised source of knowledge hub and information science provider to DRDO labs through in-house publications, DRONA and DRDO website.

Shri Gopal Bhushan, Director, DESIDOC, in his Raising Day address, provided the stock of year long activities and achievements of the DESIDOC and future roadmap. He encouraged the personnel of DESIDOC to evolve and outreach to users with innovative services and rededicate to face the challenges lying ahead. On the day, Laboratory-level DRDO Awards were distributed for the meritorious services.



Shri Gopal Bhushan delivering the Raising Day Address

Defence Research Laboratory

Defence Research Laboratory (DRL), Tezpur, celebrated its 53rd Raising Day with a week-long programme from 16 to 21 November 2015. Dr Vijay Veer, Director, DRL, delivered the Raising Day address. Dr Sajal Bhattacharyya, Professor and Head, Ashutosh

College, Calcutta University, and Dr Surya PG Ponnamp, Assistant Professor, Department of MBBT, Tezpur University, delivered Raising Day Lectures. Several programmes such as sports, inter-school science competition, family outreach programme and scientific lectures were organised to mark the occasion.

Sports activities were organised among the employees and Laboratory-level DRDO Awards were distributed to the meritorious employees. Besides, SN Dubey Award for Best Paper and Dr Vijay Veer Award for Best Product/Technology of the Year were also presented.



Dr Vijay Veer delivering the Raising Day Address

GTRE, Bengaluru

Gas Turbine Research Establishment, Bengaluru, celebrated its 56th Lab Raising Day on 20 November 2015. Dr SK Shivakumar, Vikram Sarabhai Distinguished Professor, was the Chief Guest of the event.

Shri MZ Siddique, OS and Director, GTRE, in his address, while introspecting the years gone by, brought out that GTRE has since evolved from a single project laboratory to a multi project laboratory. He emphasised that GTRE, now has understood the know why and Know how of critical Gas Turbine Technologies, which will enable the establishment to deliver products in the near future. He commended the untiring and unstinted efforts put in by all the employees in achieving the lab's objectives.



Dr SK Shivakumar, sharing his experiences of ISRO, brought out how several challenges were surmounted in the path to success. In his message, he laid stress on having a vision, so that one can move in the right direction to achieve the best. One must work sincerely and strive to achieve things which were not possible till now; this will bring the highest degree of professional satisfaction. Later, lab level awards were given away to the meritorious employees.

Scientific Analysis Group

Scientific Analysis Group (SAG), Delhi, celebrated its 52nd Raising Day on 18 November 2015. Dr Arvind Gupta, Deputy NSA and Secretary, Govt of India was the Chief Guest and Dr KD Nayak, DG (MED&CoS), DRDO, was the Guest of Honour of the function. The Directors of the sister DRDO labs, Corporate Directors and members of CPC graced the

occasion. Former SAG employees also joined for the celebration in good number. Dr G Athithan, DS, CC R&D (SAM) and Director SAG welcomed the guests and briefly described the events that had happened in SAG since its inception. He highlighted the achievements of SAG in last one year and described the new challenges that have been taken up in the area of Information and Cyber Security. He also talked about research areas where SAG is working in collaboration with various reputed institutes in India and abroad.

Dr Arvind Gupta appreciated the work being done by SAG in the area of Cryptography, Information Security and Cyber Security. He said that SAG plays a key role in National Security and expressed the need to expand the Group and build its expertise nationwide. Dr KD Nayak, Guest of Honour, in his address said that the work being done by SAG is unique and no other organization in India has this expertise in evaluation of crypto products and cryptanalysis. He suggested that SAG should interact with outside agencies and academia to tap the talent and build up the expertise nationwide. He expressed the need for SAG to play a greater role in cryptanalysis.

Chakravayuh, the annual technical magazine of SAG, was released by the Chief Guest. The employees of SAG who have completed 25 years of service were honored with mementoes. Outstanding officers, staff and teams were awarded with the Lab Awards by the Chief Guest and the Guest of Honor. Fun games were organized for SAG employees. The celebrations ended with the one hour long cultural programme prepared and presented by members of SAG family.



Release of Chakravayuh, the annual technical magazine of SAG

Manpower Development Activities

Conferences/Seminars/Symposia/Training Courses/Meetings

Prof. SK Mitra Memorial Lecture

Dr SR Vadera, OS and Director, Defence Laboratory, Jodhpur delivered Prof. SK Mitra Memorial Lecture on Sustainable Development at 31st National Convention and National Seminar of Electronics and Telecommunication Engineering under the aegis of Institute of Engineers. The event was organised at Manipal University, Jaipur. Dr Vadera was felicitated by Prof. (Col) TS Kamal, Chairman, Electronics and Communication Engineering Division Board, Institution of Engineers (India). The Session was chaired by Prof. UB Desai, Director, IIT, Hyderabad. A large number of members of the IEI (India) attend the function.



Dr SR Vadera being presented memento

DSL Advisory Committee Meeting

The meeting of the Defence Science Library (DSL) Library Advisory Committee was held on 8 December 2015 at Defence Scientific Information and Documentation Centre (DESIDOC). The committee comprises representatives from DRDO HQ and Delhi-based DRDO labs/esstts. Shri Gopal Bhushan, Director, DESIDOC also attended the meeting as the special invitee.

Dr Rajeev Vij, Sc F, Coordinator DSL, DESIDOC welcomed the participants and briefed them about the mandate of the committee. The committee discussed various issues pertaining to defence science library like

increasing user base, enhancement of services provided to the users, membership to retired DRDO employees, exploring modality of purchase of books recommended by the users at DRDO HQ, and recommendation of periodicals to be subscribed by DSL for the year 2016.



DSL Advisory Committee Meeting

Course on Basics of Mechanical Engineering

Research Centre Imarat (RCI), Hyderabad, and Centre for Personnel Talent Management (CEPTAM), Delhi, jointly organized a course on Basics of Mechanical Engineering from 30 November to 4 December 2015 under the Continuing Education Programme (CEP) of DRDO. Smt A Mangatayaru, Sc G, the Course Director, welcomed the participants and briefed about the course.

Shri Adalat Ali, Associate Director, RCI and Programme Director AD, inaugurated the course. The major topics covered during the course included: Basics of Mechanical Engineering, Materials for Military Applications, CAD/CAM, Fluid Mechanics and Hydraulic Systems, Aerospace Structures, High Pressure Pneumatics Systems.

Course on Advanced Battery Systems for Aerospace Applications

RCI also conducted a CEP Course on Advanced Battery Systems for Aerospace Applications during 16-18 November 2015. Shri Adalat Ali, Associate Director, RCI and Programme Director AD inaugurated the course.

The course covered the advanced battery systems for Aerospace applications in the present scenario and the future requirements.

Shri BV Rao, OS and Associate Director, RCI, presided over the valedictory function.



Participants of the Course on Basics of Mechanical Engineering

National Conference on Emerging Trends in Vacuum Electronic Devices & Applications

Microwave Tube Research and Development Centre (MTRDC), Bengaluru, jointly with Vacuum Electronic Devices and Applications Society (VEDAS), Bengaluru, organized a National Conference on Emerging Trends in Vacuum Electronic Devices and Applications 2015 during 3-5 December 2015 at Bharat Electronics Limited (BEL), Kalakshetra, and Central Research Laboratory, BEL, Bengaluru. Dr SN Joshi, Emeritus Scientist, Central Electronics Engineering Research

Institute (CEERI), Pilani, was the Chief Guest and Shri SK Sharma, Chief Managing Director, BEL, Bengaluru, was the Guest of Honour.

The conference featured keynote lecture by Chief Guest, two plenary sessions including seven invited talks by eminent experts and five oral sessions including 30 presentations and a poster session including 19 presentations.

The sessions focused on the scientific and technological areas driving the current and future directions in vacuum electronics research, including current interests in theory and computational tool development, active and passive components, systems, and supporting technologies focusing the topical spectrum of ISM applications in RF to THz frequency range. The conference also included an industry interaction.

Course on Microwave Tubes for Defence Systems

MTRDC, Bengaluru, conducted a four-day CEP course on Microwave Tubes for Defence Systems during 27-30 October 2015 for officers from three services and system users. The course covered lectures on operating principles, testing and trouble-shooting aspects of different types of microwave devices covering overview of microwave, millimeter and THz wave technologies; overview of microwave engineering and sources; technological aspects of linear beam and crossed field devices; handling of microwave tubes; high voltage power supplies; microwave measurements; cold



CEP Course on Microwave Tubes for Defence Systems

and hot testing of TWTs, Klystrons and Magnetrons; environmental testing of microwave tubes; mechanical interface and thermal management, etc. Visits to MTRDC and Bharat Electronics were also organised for the participants.

Training on Smart Performance Appraisals in DRDO

A one-day training session on Smart Performance Appraisals in DRDO (SPAID) was organized by Recruitment and Assessment Centre (RAC), Delhi, and RCI, Hyderabad, on 4 December 2015 at DRDO Assessment Centre (DAC), Hyderabad. Shri Sanjay Pal, Sc G, RAC, delivered the welcome address and Shri Sudhir Gupta, OS and Director, RAC, delivered the keynote address. Major module of the training/feedback session Online APAR System was presented by Shri Sanjay Pal followed by practical sessions. The conclusive session of the training was chaired by Shri Sudhir Gupta and Smt A Mangatayaru, Sc G, Head HRD, RCI.



Shri Sanjay Pal interacting with participants

National Symposium on Careers and Opportunities in Aerospace Defence Technologies

Snow and Avalanche Studies Establishment, Chandigarh, organised a two-day National Symposium on Careers and Opportunities in Aerospace Defence Technologies (CARAero-2015) in association with Aeronautical Society of India, Chandigarh Branch, during 6-7 November 2015. The symposium was a part

of societal mission and aimed at creating awareness about latest technological developments and future scenarios in the field of aerospace and defence amongst stakeholders, viz., students, working professionals and industry. The symposium was divided into four themes covering Careers and Opportunities in R&D, Academia, Armed Forces and Industry.

Shri Ashwagosh Ganju, Director, SASE, in his opening remarks delved upon the objective behind organising the symposium and said, "Indians are the largest and young human resource in the world, eager to learn, innovate and to stand out of the global crowd." He further stressed on an action-oriented effort to put on full throttle all our efforts to synergize the aerospace industry and tap business opportunities emerging in the Aerospace and Defence sector.

Dr VK Saraswat, Member NITI Aayog, and the Chief Guest of the function, in his address, elaborated 'Make in India' programme of the Government of India (GoI) and said that the emphasis has to be on design in India and it can happen either through stand-alone, foreign direct investment, collaboration or a part of offset program of Ministry of Defence. He further stated that the thrust of the R&D organizations should be in aeronautics, electronics, energy and healthcare sectors. He appraised aerospace as a huge business opportunity and the steps being taken by the GoI for the growth of Aerospace Industry in the country.

Dr A Sivathanu Pillai, ISRO Professor and founder CEO of BrahMos Aerospace, was the Chief Guest during valedictory session and delved upon the recent advances in Aerospace industry in the country with special emphasis on Missile Technologies. He stressed on 'Out of Box thinking' and cited many futuristic missions like launching a spacecraft from moon, aiming at titan and space settlement. He also presided over the panel discussions in which the delegates raised issues such as the relevance of the present curricula in line with the demands of industry, fate of graduates from Aeronautical Society of India, infrastructure issues in the departments of aerospace engineering, etc.

The symposium got an overwhelming response with the participation of more than 380 registered delegates from across the country.



CARAero 2015—Release of Souvenir

Personnel News

Promotions

Outstanding Scientist /Scientist H

Shri KPS Murthy, HEMRL



Shri KPS Murthy, Director, High Energy Materials Research Laboratory (HEMRL), Pune, has been promoted to the grade of OS/Sc H, wef 7 October 2015.

An IIT Kharagpur alumnus, Shri Murthy has made outstanding contributions in the design and development of warhead sub-systems of various missiles such as Prithvi, Akash, Nag, Air Defence, Nirbhay, etc. He was instrumental in developing many advanced warhead technologies like detonation wave aiming, deep penetration, thermobaric warheads and high performance shaped charges.

A self-reliance evangelist, he has successfully spearheaded several ToTs to Ordnance Factories and encouraged private participation in development and production activities.

In his career spanning 27 years, he has pioneered and innovated Variable Mass Preformed Fragmentation concept for developing fragmentation warheads,

tandem Warhead for 3rd generation anti tank missile system, penetration cum blast sub-munition warheads, fragment generator for Ballistic Missile Defence (BMD) applications, directional blast and shaped charges for underwater application, novel PCB and TB ammunition for MBT Arjun, 500 kg general purpose and pre-fragmented bombs, sub-munition warheads for rockets, pyro operated safety arming mechanisms (SAM), and impact delay fuzes for various weapon systems. He has published more than 30 technical papers in reputed national and international journals, seminars and symposiums and has four patents to his credit.

He is the recipient of many prestigious awards including: DRDO Agni Award for Excellence in Self Reliance in 2014, 2009 and 2005, DRDO Award for Performance Excellence in 2014 and 2012, DRDO Award for Path-Breaking Research/Outstanding Technology Development in 2008, DRDO Scientist of the year Award in 2008, Dr Biren Roy Trust Award (AeSI) in 2007, DRDO Laboratory-level Technology Group Award in 2006.

He is a life member of Aeronautical Society of India (AeSI), High Energy Material Society of India (HEMSI) and Indian National Society for Aerospace and related mechanisms (INSARM). At present, he is leading the INSARM Pune chapter as President and as Vice Chairman at the National level.

Shri Nirnanjan Das, DMRL



Shri Nirnanjan Das, Defence Metallurgical Research Laboratory (DMRL), Hyderabad, has been promoted to the grade of OS/Sc H wef 9 October 2015. Shri Das obtained his BTech in Metallurgical Engineering from National Institute of Technology (NIT), Jaipur, and MTech from Indian Institute of Technology (IIT), Kanpur.

Shri Das is working in DMRL since last 30 years in the field of vacuum investment casting technology and has made significant contributions to the development of directional solidified (DS) and single crystal castings of complex geometry for advanced aero-engines, and integral rotor wheels with fine grained hub of jet fuel starters for auxiliary power units.

He has several patents to his credit, which include third generation super alloys, equipment design for directional solidification, a special strategy for precision casting of thin walled aerofoil having complex cooling air passages and hybrid grain structure in single step integral rotor castings with fine grained hub and columnar grained blades.

In recognition of his numerous contributions, he has received several awards including DRDO Scientist of the Year Award in 1986, DRDO Agni Award in 2001, Metallurgist of the Year Award in 2005, and Indian Foundry Man of the Year in 2006.

Appointments

Director INMAS



Dr Ajay Kumar Singh, OS, has assumed the charge of Director, Institute of Nuclear Medicine and Allied Sciences (INMAS), Delhi, wef 1 October 2015. Prior to this, he headed three centres of HR Management in DRDO, viz., Centre for Personnel Talent Management (CEPTAM) from June 2007 to September 2010 and Corporate Directorates of Human Resource Development (DHRD) from October 2010 to 27 February 2013 and Directorate of Personnel

(DOP), from 28 February 2013 to 17 June 2015.

Dr AK Singh did his MSc (Hons) in Biophysics from Punjab University and obtained his doctorate from Jamia Milia Islamia, Delhi, on Infection Imaging. He joined DRDO in 1988 and during his 25 years of service, has made significant contributions in Infection Imaging and Internal Decorporation of Fission Produced Radionuclides. He has developed a Diagnobact Kit, for detection of infectious lesion.

Dr Singh is the recipient of many accolades in recognition of his contributions for Life Sciences and HR Management. Few to mention are Young Scientist Award in 1999 instituted by Brig. SK Mazumdar Memorial Trust for development of Ciprofloxacin Kit for Specific Infection Imaging; DRDO Technology Award in 2000 for development of Diagnostics Radiopharmaceuticals; Oration Award at Chandigarh Science Congress in 2012; Mrs Thangam Vasudevan Award by Indian Association of Biomedical Scientist in 2001 for development of Cold Kit for Instant Preparation of Tc-99m-4-Fluoroquinolone for Specific Infection Imaging and DRDO Scientist of the Year Award in 2006 for his outstanding contributions in DRDO.

He is a Life Member of Indian College of Nuclear Medicine (ICNM), Society of Nuclear Medicine of India (SNM), Indian Association of Biomedical Scientist (IABMS), and National Human Resource Development Network (NHRDN). Presently he is immediate past president of Indian Association of Biomedical Scientists. He has also participated in XIX Indian Scientific Antarctic Expedition as a summer member. He has guided many PhD students and also been PhD examiner of several universities.

He has been instrumental in taking various initiatives for the future development in the field of aerospace and aeronautics as Coordinator, Aeronautics Resource Panel. Under his benevolent guidance various conferences and symposiums have been organised by the panel to promote lectures, exhibitions, competitions for generating interest and exposure in the field of Aerospace and Aeronautics.

He has a number of patents and publications to his credit. He has patronized sports activities with equal enthusiasm as president DRDO Sports Board.

Director, ITR



Dr BK Das, OS, has taken over as Director, Integrated Test Range (ITR), Chandipur, with effect from 18 November 2015.

Dr Das joined DRDO in 1987 and has been involved in the performance evaluation of missiles, rockets and various other airborne weapon systems. He has supported almost all the missions conducted from ITR and has led the team for the upgradation of Electro Optical Tracking Systems. He was actively involved in the design and development of Real Time Automatic Video Tracker, Post Processing System, Video Encoder, Electro Optical Tracking System and a number of sub-systems in Telemetry and Radar.

He has enhanced the tracking range of EOTS with augmentation of high performance sensors and image processing. The development of Electro Optic Tracking Telemetry (EOTM) and its deployment has produced outstanding result during the Kalinga Mission. He has led the team towards realization of Kalinga Range to support the B 05 and K4 missions in shortest possible time. Dr Das has actively contributed for setting up of island and mainland complexes along with instrumentation. Concurrent support from Chandipur and Dhamra complex during Target and Interceptor missiles launch reflects his skill of range management. He has developed a number of critical sub-systems, which are augmented with the range systems to enhance their potential.

Dr Das did his BTech in Electronics from Burla Engineering College, Odisha, and MTech in Computer Science and Doctoral Research in Supercomputer from IIT, Kharagpur. He was the recipient of Best Graduate Gold Medal winner in BTech and Topper of IIT in MTech. His Thesis was awarded as the Best Thesis by USA.

Dr Das has given his research deliberation in all the leading countries of the World and has received a number of national and international awards, which include Lakshmi Pat Singhania-IIM, Lucknow National Leadership Award as the Young Leader of the country in science and technology for the year 2008 (one award for the country); National Award by National Research and Development Corporation (NRDC) for the technological

development in Image Processing and Electro Optics for 1997-98 (only recipient among all the DRDO labs and ISRO centres); Young Engineer National Award and Medallion by Indian National Academy of Engineering (INAE) for contribution in Electro Optics and Image Processing for 1999 (national topper); Best Presentation among 300 presenters from 30 countries in 16th IASTED International Conference on Parallel and Distributed Computing and Systems, Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts, USA, November, 2004; Best Presenter Award in the 25th Annual ITEA International Symposium on Transformational Test and Evaluation at USA during September, 2005 (Only recipient from Asia); Best Presenter Award in SETE 2007 at Sydney, Australia in September, 2007; Selected and featured in Who is Who of the World as a young leader of the millennium in Engineering; Young Scientist Award by Orissa Vigyan Academy for outstanding contribution in Image Processing (only one award for the State); Newton Award as the Best Scientist of Orissa by Utkal Diwas Committee; Prativashree Award as the best upcoming talent of the State; Scientist of the Year Award for the year 2003 for outstanding contribution in the field of Electro Optics; Award for Path Breaking Research as a member of the team for Air Defence Systems for the year 2006-07; Award for Pathbreaking Research as a member of the team for K 15 Programme for the year 2007-08; and Best Presentation Award in National Science Day 1996.

He has more than 100 publications in various national and international journals and conferences.

Awards

DRDO Technology Group Award

Dr Ashim Kumar Mukhopadhyay, OS and Associate Director, Defence Metallurgical Research Laboratory (DMRL), Hyderabad, and his team have been awarded DRDO Technology Group Award-2014 for their contributions on industrial scale development and production of aluminium alloys for Sarvatra Bridging System, New Generation Anti-radiation Missile and Futuristic Infantry Combat Vehicle. The award was presented by Dr V Bhujanga Rao, DS and DG (NS&M), DRDO.

Agni Award for Excellence in Self-Reliance

✧ Agni award for Excellence in Self Reliance–2014 has been bestowed upon the team headed by Smt D Padma, Sc G, Centre for Artificial Intelligence and Robotics (CAIR), Bengaluru, for design, development and successful prototype implementation of Communication Interface Unit (CIU) for the Army Air Defence. The CIU enables the user to communicate the data in real time and within required time limits over five different media.



✧ Dr Mukhopadhyay, OS and Associate Director, DMRL, and his team received Agni Award for Excellence in Self-Reliance–2013 from Shri Manohar Parrikar, the hon'ble Raksha Mantri on 14 November 2015 at Vizag. The award was conferred on Dr Mukhopadhyay and his team for their outstanding contributions towards achieving self-reliance in design, processing, productionization and quality control of aluminium alloy technologies for applications in missiles, ammunitions and naval ship building.

Young Scientist Award

Shri Lokesh Saini, Sc D, Defence Laboratory, Jodhpur, has been conferred DRDO Young Scientist



Award–2014 on 23 September 2015 by Dr S Christopher, Secretary Department of Defence R&D and DG DRDO for his significant contributions in the Development of Radar Absorbing Materials, their composites and final products in the form of sheets/coatings. One of these materials has been used in the indigenous development of Microwave Absorbing Gasket for BrahMos missile.

Popular Science Communication Award

✧ Shri Sartaj Singh, Sc F, CAIR, and his team have been awarded Popular Science Communication Award–2014 for popularizing robotics technology in the country by developing and demonstrating concepts through various working models, motivating and encouraging the student community by making accessible robotic platforms.



✧ Dr Rajeev Vij, Sc F, Institute of Nuclear Medicine and Allied Sciences (INMAS), Delhi, was awarded Popular Science Communication Award-2013 for successful dissemination of DRDO's achievements to academia, R&D institutions, services and general public. The award was presented by hon'ble Raksha Mantri Shri Manohar Parrikar on 14 November 2015 at Vizag.



Best Performance Award

Shri AS Manoharan, TO C, CAIR, has been awarded Best Performance Award-2014 for his exemplary dedication and commitment in his assignments ranging from fabrication of filter and interface electronics, and participation in user trials of RTS and FCCS.



Higher Qualification Acquired

Laser Science & Technology Centre

Shri Raveesh Kumar, Sc G, Laser Science and Technology Centre (LASTEC), Delhi, has been awarded



PhD in Mechanical and Automation Engineering from Guru Gobind Singh Indra Prastha University, Delhi, for the thesis titled Miniature Heat Exchangers for Cryogenic Applications.

DRDO HQ



Shri Kumresh Kumar Gaur, Sc E, Office of Chief Controller R&D (RM and Imp), DRDO HQ, has been awarded PhD by the IIT Delhi, for the thesis titled Studies on Design and Analysis of Low Velocity Impact on Injection Molded Microcellular Thermoplastic Hip Protection Device.

Naval Physical & Oceanographic Laboratory



Shri Sooraj K Ambat, Sc D, Naval Physical and Oceanographic Laboratory (NPOL), Kochi, has been awarded PhD from the IISc Bengaluru, for the thesis titled Fusion of Sparse Reconstruction Algorithms in Compressed Sensing.

Kaumi Ekta Saptah

Defence Laboratory Jodhpur (DLJ) observed Kaumi Ekta Saptah during 19-25 November 2015 to foster and reinforce the spirit of communal harmony across the country.

Dr SR Vadera, OS and Director, DLJ, administered the oath of national integrity to officers and staff of the laboratory. During the period of one week, Drawing Competition for children of different age groups and Mehendi Competition for ladies were organised. Ladies and children of DLJ employees participated in the competitions with lot of enthusiasm. A Magic Show was organized at DLJ Seminar Hall during the closing ceremony of the Saptah. The programme was attended by the DLJ families. Smt Kiran Vadera, the first lady of DLJ, was the Chief Guest and gave away the prizes to the winners of the competitions.

Karnataka Rajyotsava

Gas Turbine Research Establishment, Bengaluru, celebrated Karnataka Rajyotsava on 20 November 2015. Shri MZ Siddique, OS and Director GTRE, presided over the function. Dr NS Lakshminarayana Bhatta, Poet and Author, was the Chief Guest on the occasion. Shri MN Suresh, theatre and television artist and Smt A Barkathunissa Siddique, were the Guests of Honour. GTRE Fine Arts Club conducted several cultural and sports competitions to mark the occasion. The Chief Guest distributed prizes to the winners.



Vigilance Awareness Week

Combat Vehicles Research and Development Establishment have observed Vigilance Awareness Week from 26 October 2015 to 31 October 2015. As part of the week, a workshop was conducted on 'Preventive Vigilance as a Tool for Good Governance.'

Shri N Vittal, IAS (Retd) and former Central Vigilance Commissioner, delivered a talk on the theme of the workshop. He compared various types of vigilance with predictive, preventive and break down maintenance. He elaborated on good governance and ways and means to bring the same in government organizations.

Shri N Venugopal, IPS, Deputy Inspector General of Police, CISF, South Zone, delivered a special address on 'Preventive Measures for Cyber Crime and Corruption.' He emphasized the importance of computerization to reduce corruption. He also enlightened about the explosion of cyber crimes through various real-life case studies, and elaborated on the precautions to be taken by government employees to avoid getting entangled in cyber crime and corruption.



Dr P Sivakumar, DS and Director CVRDE, reminded about the evils and punitive actions quoted in Koutilya's Artha Shastra. He recollected the vision of former president Dr APJ Abdul Kalam that India should be a developed country in 2020 and said, "Dr Kalam desired India to be a corruption free nation by 2020 with the cooperation of everyone."

Earlier, Chief Vigilance Officer, Dr BI Ravi, Additional Director Sustenance, during his welcome address, brought out that corruption originates from greed and condemnation against corruption was emphasized in all epics, since time immemorial.

Sports Round-up

DRDO North Zone Badminton Championship 2015

Defence Laboratory, Jodhpur, won Team Championship consecutively for the 9th year in the DRDO North Zone Badminton Championship-2015 organized at Laser Science and Technology Centre (LASTEC), Delhi during 3-6 November 2015. Eighteen teams participated in the tournament. The team comprised Lt Col Joji Paul, Shri R N S Shekhawat, Shri JS Hooda, Shri Nar Singh Yadav, Shri Ashwani Sharma, Shri Vijay Pal Singh, and Shri Vishav Jeet.

DLJ also won the open singles title in the tournament. Shri Vishav Jeet and Shri Ashwani Sharma of DLJ were winner and runners up, respectively in the open singles



DLJ team with DRDO North Zone Badminton Champions Trophy

event. Shri Vishav Jeet of DLJ also won the 'Player of the Tournament' trophy for his outstanding performance throughout the tournament. Three players of DLJ, Shri Vishav Jeet, Ashwani Sharma and Lt Col Joji Paul were selected for the North Zone team for the national tournament in Bengaluru.

DRDO North Zone Carom Tournament

Defence Materials and Stores Research and Development Establishment (DMSRDE), Kanpur,

organized DRDO North Zone Carom Tournament from 16-18 November 2015. Fourteen DRDO labs of North Zone participated in the tournament. DMSRDE Kanpur emerged as the winner and SSPL Delhi, they were the runner up. DMSRDE showed its overall superiority by winning both Open Men Single and Women Single events. Shri Mohd Salim and Shri Chandrashekhar were the winner and runner up in the Men Single, and Dr Kavita Agarwal and Smt Priyanka Katiyar were the winner and runner up in Women Single, respectively.



Team DMSRDE with DRDO North Zone Carom Trophy

Visitors to DRDO Labs/Estts

Combat Vehicles Research & Development Establishment

Shri G Mohan Kumar, IAS, Defence Secretary, visited Combat Vehicles Research and Development Establishment (CVRDE), Chennai, on 27 November 2015. Dr P Sivakumar, DS and Director, CVRDE, made a presentation on the various ongoing projects and technology development projects for NG MBT.



Defence Laboratory

Air Marshal PP Reddy, VM, ADC, Chief of Integrated Defence Staff, visited Defence Laboratory Jodhpur (DLJ) on 19 November 2015. Director, DLJ briefed him about the Core Competence, Technical Infrastructure, Technical Activities and Achievements of the laboratory.



Defence Scientific Information & Documentation Centre

Dr Jan Brase, Head of Research and Development, Göttingen State and University Library, Germany, visited Defence Scientific Information and Documentation Centre (DESIDOC), Delhi. Shri Gopal Bhushan, Director, DESIDOC, discussed international cooperation for Big Data and Data Citation aspects with Dr Brase.



Defence Metallurgy Research Laboratory

Dr S Christopher, Secretary, Department of Defence R&D and DG, DRDO, Dr SC Sati, OS and DG (NS& M) and Shri Benjamin Lionel, Sc G, Programme Office-II visited Defence Metallurgical Research Laboratory (DMRL), Hyderabad on 2 November 2015. Dr Samir V Kamat, OS and Director, DMRL, briefed the visitors about the achievements, current projects and future roadmap of the laboratory. Dr Christopher also visited technical facilities of the laboratory and evinced great interest in the activities and exhibits of Enabling Technology Centre (ETC), Powder Metallurgy (PM) Plant and Armour Technology.



Research & Assessment Centre

Dr S Christopher, Secretary, Department of Defence R&D and DG, DRDO, and Chairman Research and Assessment Centre (RAC) visited RAC on 5 November 2015 along with Dr CP Ramanarayanan, DS and CCR&D (HR). Shri Sudhir Gupta, OS and Director RAC, briefed the DG DRDO about the activities and future plans of RAC.

Dr Christopher also visited Darpan, the permanent Exhibition of DRDO housed at RAC and appreciated the efforts.



Naval Physical & Oceanographic Laboratory

✧ Dr S Christopher, Secretary, Department of Defence R&D and DG, DRDO visited Naval Physical and Oceanographic Laboratory (NPOL), Kochi, on 7 December 2015.

✧ Vice Admiral P Murugesan, AVSM, VSM, VCNS visited NPOL, Kochi, on 20 November 2015.

