‘Find the unique YOU’, urged Dr APJ Abdul Kalam, the former President of India while addressing a gathering of DRDO’s top leaders, DRDO awardees, and members of the ‘Mahila Kalyan Manch’. Dr Kalam was the Chief Guest, during the DRDO Awards Ceremony held on 26 March 2011, at Bhagavantam Auditorium, Metcalfe House, Delhi. These awards are given each year during the DRDO Directors’ Conference. The Young Scientist Awards are given to DRDS scientists and the Best Performance Awards are given to DRTC personnel and personnel from Administration, Stores and Allied Cadres.

Dr Kalam said ‘I am delighted to participate in this 35th DRDO Directors’ Conference and give away the awards. I am very happy to see young people getting awards’. He also stressed on the importance of focusing attention on the technologies for meeting future defence needs – 2030 and beyond, he emphasised that significant share of DRDO’s efforts and resources need to be spent on such technologies.

The DRDO Directors’ Conference was held during 25–27 March 2011, where top DRDO officials led by SA to RM, deliberated on various defence technologies. The theme was ‘Emerging War Scenarios and Strategies’. The Conference was inaugurated by Shri AK Antony, Honorable Raksha Mantri on 25 March 2011 at DRDO Bhawan, New Delhi.

In his welcome address, Dr VK Saraswat, SA to RM, DG DRDO, and Secretary, Defence R&D, described Dr Kalam as ‘true inspirator and role model for DRDO’s young scientists and technologists for his vision of developed India’ and ‘father of the missile programme of India’. Talking about some recent accomplishments of DRDO, he highlighted the Initial Operational Clearance for Light Combat Aircraft, Tejas and role out of prototype of its Naval version; maiden flight test of Medium Altitude Long-Endurance Unmanned Aerial Vehicle- RUSTOM; successful launches of Agni, Prithvi, and Dhanush missiles by users; successful Interceptor Missile Test, and successful launch of BrahMos missile.
He also mentioned about the induction of Under Barrel Grenade Launcher; Multi-mode Grenade; Carrier Command Post Tracked Vehicle; and delivery of Multi-Barrel Rocket Launcher System—Pinaka, MBT Arjun tanks; NBC Recce Vehicle, and Armoured Engineering Recce Vehicles. He also mentioned about the recent initiatives in the areas of technologies and systems. Dr Saraswat gave credit for these accomplishments to the committed bright DRDO scientists, technologists, and other personnel.

Shri Arvind Kaushal, Principal Controller of Defence Accounts (PDCA) (Research & Development) handed over the General Provident Fund Statement for the financial year 2010–11 to Dr VK Saraswat, SA to RM, DG DRDO, and Secretary, Defence R&D, on 31 March 2011 at a function held at DRDO Bhawan, Delhi. The function was attended by Dr W Selvamurthy, DS and CC R&D (LS), Shri G Elangovan, DS and CC R&D (R&M), Dr K Sekhar, OS and CC R&D (MS & LIC), Dr R Sreehari Rao, OS and CC R&D (ECS), Dr KD Nayak, OS and CC R&D (MED & MIST), Dr SC Pandey, Addl. FA (P) & JS, Ministry of Defence (Finance), Shri KVR Murty, Integrated Financial Advisor, DRDO, and other senior officers of the organisation.

The delivery of GPF accounts statements in March 2011 itself to almost 20,000 subscribers of DRDO located at far places such as Leh in North, Tejpur in East, Ahmednagar in West, and Kochi in South marks a significant improvement over the position in past years when these accounts were given to the subscribers in July and August 2010. Achieving this involved detailed planning, business process re-engineering, switching over to a contemporary database system, and close coordination with DRDO labs in different parts of the country. Shri Kaushal assured SA to RM that PDCA is committed to bringing about more improvement in delivery of its services to DRDO.

In his address, Dr Saraswat lauded the work being performed by PCDA and the value it is adding to the efforts of DRDO. He appreciated the early delivery of GPF accounts statements, a great initiative showing professional approach.
US firm enters into Licensing Agreement with DRDO

A USA-based firm Crowe & Company, LLC has entered into a licensing agreement with DRDO to acquire the technology of Explosive Detection Kit developed by High Energy Materials Research Laboratory (HEMRL), Pune, one of the constituent laboratories of DRDO. HEMRL has developed a kit for quick detection and identification of explosives. The kit can detect and identify explosives based on any combination of nitro-esters, nitramines, trinitrotoluene (TNT), dynamite or black powder. The testing requires only 3–5 mg of suspected sample and only 3–4 drops of reagents. The explosive detection kit comes packed either in a box (size of a vanity case) or in miniature vials that can be kept in shirt pockets.

Crowe & Company had approached FICCI under the DRDO–FICCI Accelerated Technology Assessment Commercialisation (ATAC) programme to enter into MoU for licensing agreement with DRDO for the said technology. Dr Prahlada, DS and CC R&D (Ae & SI), the key architect of DRDO–FICCI ATAC initiative, said ‘the ATAC programme has achieved a major milestone with the US Company taking DRDO technology for use by US homeland security and for international markets’. Shri S Sundaresh, DS and CC R&D (ACE); Dr Subhananda Rao, DS and Director HEMRL, Pune; Shri S Radhakrishnan, Director, DIITM, DRDO; and Shri Nirankar Saxena, Director, FICCI were also present on the occasion.

Ms Faye Crowe, President of Crowe & Company informed they are planning to introduce the explosive detection kit to the US Army, US homeland security forces and in other international markets after getting the necessary approvals from the US regulatory institutions. The event was witnessed by officials from DRDO, FICCI, and media persons.

Dr VK Saraswat, SA to RM, inaugurated the new, ‘JC Bose Microwave Tube Facility’ established at Microwave Tube Research and Development Centre (MTRDC), Bengaluru, on 09 April 2011. This Centre houses state-of-the-art precision fabrication machineries, high-voltage test facilities, environment test facilities, high microwave generation, and diagnostics facilities.

On this occasion, one of the latest products, ‘Microwave Power Module’ (MPM) for FLR system, developed by MTRDC with the help of Bharat Electronics Limited (BEL), Bengaluru, was handed over for the Akash Missile Programme. Dr Saraswat in his inaugural address said that the indigenous development of MPM for FLR system was significant as a supportive system of missile development, thereby reducing the imports. He also said that this is a perfect example of BEL–DRDO synergy and has initiated the work on various supportive systems of weapon integration to meet the futuristic requirement of defence forces.

Dr Lalit Kumar, OS and Director, MTRDC, in his welcome address expressed that this facility will be fully utilised to produce best quality products required for defence services. Shri HS Bhadoria, Director (BC), BEL, Bengaluru, assured complete support for the productionisation of the products developed by DRDO. The inaugural function was attended by Dr W Selvamurthy, DS and CC R&D (LS); Dr KD Nayak, OS and CC R&D (MED & MSIT) and several other dignitaries.
The Foundation Stone for Seakeeping and Manoeuvring Basin (SMB) facility at the Naval Science and Technological Laboratory (NSTL), Visakhapatnam, was laid by Dr VK Saraswat, SA to RM, DG DRDO, and Secretary, Defence R&D on 01 April 2011. The ceremony was attended by Dr J Narayana Das, OS and CC R&D (NS, M & HR); Shri Beela Satyanarayana, VC, Andhra University; Vice Admiral Dinesh Prabhakar, AVSM VSM NM, Project Director (SBC); Rear Admiral Shekhar Mital, NM, DGND(SDG); local dignitaries and senior officers from DRDO and Indian Navy. M/s Cussons Technology Ltd, UK, will supply the equipment and associated technical services for the SMB at an approximate cost of Rs 104 crore and CC (R&D) (South) will execute the civil works of the project at a cost of Rs 45.73 crore. SA to RM expressed his happiness for the whole-hearted participation of the Indian Navy as partner in this project.

The Seakeeping and Manoeuvring Basin at NSTL, is a state-of-the-art hydrodynamic model testing facility, and one of the best of its kind in the world, is being set up at a cost of Rs 170 crore. The facility puts India among the few nations in the world having capability to undertake comprehensive hydrodynamic model testing. The facility completes the essential trio of major hydrodynamic test facilities at NSTL along with the High Speed Towing Tank (HSTT) and the Cavitation Tunnel (CT), which were set up in 1992 and 2001, respectively. As a national facility, SMB would usher in self-reliance in hydrodynamic model testing in the country, enhancing the capability of the DRDO/Navy to design and build state-of-the-art naval combatants such as torpedoes, mines, and submarines of strategic importance.

SMB will be used for evaluating/assessing the manoeuvring and seakeeping characteristics of marine vessels through model tests in simulated conditions using captive and free sailing models. SMB consists of a basin of dimensions 135m (L) x 37m (B) x 5m (D) on which a computerised multi-motion carriage capable of carrying out captive and free running model tests moves at a maximum speed of 6 m/s in X direction. It is also equipped with segmented type wave makers for simulating actual sea conditions, wave absorbers, sophisticated measuring equipment, optical model tracking system and multi-channel high sampling rate data acquisition system to carry out the model tests, and a building covering fully the basin and other ancillary units.
The Filter Development Centre of Combat Vehicles Research and Development Estt (CVRDE), Chennai, has indigenously designed and developed six types of hydraulic filters for Light Combat Aircraft - Tejas. These filters operate in pressure line, return line, and case drain with operating pressure ranging from 35 bar to 280 bar, flow rate from 5 lpm to 120 lpm, and filtration rating of 10 μ to 25 μ with temperature range of -54 °C to 135 °C.

Qualification Tests
The developed filters were rigorously tested for both development trials and qualification tests (QT) as per international standards MIL-F-8815D and MIL-STD-810E.

Bubble point, clean element pressure drop, cold immersion, hot immersion, cold start, multi-pass, flow fatigue and media, and abrasion migration test were conducted for filter elements. Proof pressure, housing pressure drop, shut-off valve cycling, differential pressure indicator, bypass valve cycling, impulse pressure, acceleration, vibration, shock, thermal shock, extreme temperature, and burst pressure were carried out as QT for assembly. Regional Centre for Military Airworthiness (RCMA) and Directorate General Aeronautical Quality Assurance (DGAQA) coordinated during the design, development, and qualification testing of the filters at CVRDE, CMTI, and LRDE for successfully developing the filters for LCA-Tejas and initially, provisional clearance was accorded for flight trials. These hydraulic filters assembled in LCA-Tejas, have successfully completed more than 1500 flight trials.

As a precursor to induction into the Indian Air Force, ‘Type Approval’ from Centre for Military Airworthiness and Certification (CEMILAC) is mandatory. Based on their performance during flight trials, CEMILAC has accorded ‘Type Approval Certificate’ for these filters.

Test Facilities Established
Extensive test facilities have been established at CVRDE as per International Standards of MIL-F-8815D: Bubble-point test rig, multi-pass test rig, cold-start test rig, collapse-pressure test rig, impulse-pressure test rig, proof-pressure test rig, shut-off valve test rig, ultrasonic cleaner, and bottle flushing stand to clean the bottles to collect oil samples, UCC particle counters to check oil, and contamination levels to find filtration efficiency.

Technologies Established
The technologies/facilities involved in the design, development, and qualification testing of filters for aircraft applications were established at the following government agencies and industrial establishments.

<table>
<thead>
<tr>
<th>Technologies/facilities</th>
<th>Govt. Agencies and Industrial Estts.</th>
</tr>
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<tbody>
<tr>
<td>Machined and standard parts</td>
<td>CVRDE, Chennai; CMTI, Bengaluru; GTTC, Bengaluru; HAL (Aircraft Division), Bengaluru; M/s. Jaya Tools, Chennai.</td>
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<tr>
<td>for development of precision</td>
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<td>components</td>
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<tr>
<td>Filter Elements</td>
<td>M/s Mikroflo Filters Pvt. Ltd., Hyderabad.</td>
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<tr>
<td>Rubber Items</td>
<td>M/s Aliga Rubber Works, Kanpur.</td>
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<tr>
<td>Springs</td>
<td>M/s Super Springs, Bengaluru.</td>
</tr>
<tr>
<td>Assembly and Testing</td>
<td>CVRDE, Chennai; CMTI, Bengaluru; LRDE, Bengaluru.</td>
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Kaveri engine was integrated with IL-76 aircraft, which is a well established Flying Test Bed (FTB) for engines at Gromov Flight Research Institute (GFRI), Russia. The flight trials commenced on 03 November 2010 and 11 flight tests for about 20 h duration have been completed till April 2011.

Kaveri engine is one among the four engines on the FTB platform.

The flight tests successfully carried out so far are up to 12 km maximum altitude and a maximum forward speed of 0.7 Mach No. The tests conducted so far include testing for engine performance under different operating conditions of the engine. With this, the first phase of Kaveri engine FTB trials have been completed successfully and further tests will continue from May 2011.

International Women's Day Celebrations

CABS, Bengaluru


LRDE, Bengaluru

Electronics and Radar Development Establishment (LRDE) celebrated IWD on 08 March 2011. All women officers and staff actively participated in the celebrations and events such as rangoli making, walking on the bricks, paper ribbon preparation, identifying the goal, minute-to-win, etc were organised. A cultural show was also organised. Dr Meena Chakkavarty was invited as the Chief Guest. She highlighted the struggles and challenges women faced in today’s world.

NPOL, Kochi

Dr Radha Thevannoor, Director, MBA SCMS School of Technology and Management, Kochi, delivered an invited talk on ‘Which society are we in?’ on 08 March 2011. She focused on increased longevity pattern of women and the significance of their healthcare to cope up with the effective dual role of women, both in office and at home. Director, NPOL addressed the gathering and highlighted the relevance of the celebration of IWD.

RCI, Hyderabad

Research Centre Imarat (RCI) celebrated IWD on 30 March 2011. Smt B Rukmini, Sc ‘E’, RCI, and Chair Person, IWD delivered the welcome address. Smt Arundhati Bhattacharya, Sc ‘G’, RCI, and Ms A Swarna Bai, Sc ‘D’ delivered lectures on importance of Women’s Day. Smt Poonam Malakondaiah, IAS, Commissioner, Panchayati Raj and Rural Development, Andhra Pradesh, was the Chief Guest. Shri SK Ray, DS and Director, RCI presided over the function. Smt Aleena Sasikumar Sc ‘C’, RCI proposed the vote of thanks.
NPOL’S Spin-off Product
‘Sanjeevani’ for Fire Force

‘Sanjeevani’ – the acoustic life detector developed by Naval Physical and Oceanographic Laboratory (NPOL), Kochi, was handed over to the Fire and Rescue Service of Kerala at a special function on 08 March 2011 at Kochi. The detector is capable of saving people trapped in the debris of collapsed buildings due to natural disasters like earthquake. Shri S Anantha Narayanan, Director, NPOL, highlighted the relevance of the product and its application in rescuing human life. He handed over the device to Shri Joe Kuruvila Eso, Fire and Safety Divisional Officer, Thrikkakara. Shri N Sadish Kumar, Sc ‘E’, NPOL; Shri Abdul Rasheed, Station Officer, Fire and Rescue Services; and Shri Roby Varghese, Angamaly Station Officer were also present on the occasion.

Meeting on Technologies for Combating Low Intensity Conflicts

A meeting on Low-intensity Conflicts with law-enforcing agencies (CRPF, BP R&D, Coast Guard HQ, ITBP, NSG, and BSF) was held at Recruitment and Assessment Centre (RAC) on 04 April 2011. The Meeting was chaired by Dr R Chidambaram, Principal Scientific Adviser (PSA) to Govt of India. Dr PS Goel, Chairman, RAC, Dr K Sekhar, OS and CC R&D (MS & LIC), Directors, and senior scientists from various DRDO labs were present in the meeting. A number of presentations were made by the scientists. Dr Chidambaram and the users appreciated the progress on LIC activities in DRDO. Users also visited DRDO Exhibition (Darpan) and were appraised of the recent developments by the Director RAC.

National Safety Week

NPOL, Kochi

Naval Physical and Oceanographic Laboratory organised the 40th National Safety Week campaign on 04 March 2011, to promote safety awareness in the organisation. Shri P Vinod, Sc ‘E’, Chairman, Safety Committee, welcomed the gathering and emphasised the importance and relevance of safety. Shri PT Joseph, Faculty, Kerala State Productivity Council, delivered a talk on ‘Accident Prevention’. Shri S Anantha Narayanan, Director, NPOL, presented the prizes to the winners of the safety day competitions. The programme concluded with a live mock drill on fire-fighting.

RCI, Hyderabad

The 40th National Safety Week was celebrated at Research Centre Imarat (RCI) on 11 March 2011. Shri K Rama Sharma, Sc ‘G’, DOMS, RCI administered the safety pledge. Shri JN Rao, AGM, Head, Safety Engg, Bharat Heavy Electricals Limited (BHEL), Hyderabad, was the Chief Guest. In his keynote address, he stressed on the importance of safety in all government organisations. Shri SK Ray, DS and Director, RCI presided over the function.
Manpower Development Activities

Training Courses

NPOL, Kochi

IN-house Conference for Middle-level Scientists

An IN-house Conference for Middle-level Scientists (INCOMS-2011) was organised at NPOL, Kochi, during 23–24 March 2011. Shri S Anantha Narayan, Director, NPOL inaugurated the conference. The conference was aimed to provide a suitable platform for scientists to present papers in their area of specialisation and refine their technical communication skills for information sharing. It included four technical sessions, viz., knowledge management and information technology, electronics and computer science, science and engineering with special key note addresses by internal experts for each session. About 21 scientists participated and presented papers in the conference.

RCI, Hyderabad

Special Trainings

High Power Electromagnetic Systems

A two-day special training course on ‘High Power Electromagnetic Systems’ was conducted by Directorate of Electromagnetics during 2–3 March 2011 at RCI. The course was inaugurated by Shri SK Ray, DS and Director, RCI. 30 scientists from RCI, LRDE, MTRDC, ARDE, and TBRL attended the course.

The faculty comprised renowned scientist, Dr DV Giri, from USA and eminent scientists from Bhabha Atomic Research Centre, and DRDO. Topics included high-power electromagnetic sources, high-voltage components and devices, measurement and diagnostics, and high-voltage manufacturing and fabrications. Dr VG Borkar, Sc ‘G’ was the Course Director and Shri Sandeep Satav, Sc ‘E’ was the Course coordinator, Shri VV Rama Sarma, Sc ‘G’ proposed the vote of thanks.

VX Works 6.8 Work Bench Fundamentals and BSP

A special training programme on ‘VX Works 6.8 Work Bench Fundamentals and BSP’ was organised for scientists of RCI in two batches, from 21–25 February 2011 and from 7–11 March 2011. M/s CoreEL Technologies, Bengaluru, conducted the training programme at their local centre in Hyderabad. The objective of the training was to develop embedded software efficiently using tools. About 32 participants attended the programme in both the batches. A test was conducted at the end, and Shri BHVSN Murthy, Sc ‘G’, Director, R_Tech gave away prizes to the winners.

Linux Kernel and Embedded Developer with Emphasis on RTOS

A special training programme on ‘Linux Kernel and Embedded Developer with Emphasis on RTOS’ was conducted during 14 February to 18 March 2011. The training schedule was for 4 h per day for 5 weeks. M/s Veda Solutions, Hyderabad, provided the training to RCI scientists.

The proposed training was tailor-made for RCI requirements and to train scientists to carry out software development. About 68 participants attended the programme. A test was conducted at the end, and Shri BHVSN Murthy, Sc ‘G’, Director, R_Tech gave away prizes to the winners.

Computer Literacy

A special training programme on ‘Computer Literacy’ was conducted during 14–16 March at RCI. Shri SK Ray, DS and Director RCI and Programme Director MRSAM, gave the inaugural address.

The objective of the programme was to achieve a set goal of 100 per cent in computer literacy. The course was designed for staff / officers of RCI who required basic computer knowledge. This programme also included the usage of RCI intranet and packages available. 52 participants attended the programme making RCI 100 per cent computer literate. A test was conducted at the end, and Shri K Jagadesan, Sc ‘G’, Director, ENTEST gave the prizes to the winners. A text book titled ‘Comdex Computer Course KIT Windows ‘XP with Office 2007’ by Vikas Gupta, was given to all the participants along with the kit.

Shri M Sankar Kishore was the Course Director, for all the above trainings.
Chief Controller R&D (Life Sciences and International Cooperation)

Dr W Selvamurthy, Distinguished Scientist and Chief Controller R&D (Life Sciences), has been appointed as Chief Controller R&D for Life Sciences (LS) and International Cooperation (IC) w.e.f 03 May 2011.

He obtained post-graduation in Human Physiology from Christian Medical College, Vellore, in 1972 and PhD from University of Delhi in 1982, and Doctorate of Science (DSc) from Swami Vivekananda Yoga Anusandhana Samsthana (Deemed University), Bengaluru in 2006. He was awarded DSc (Honoris Causa) by Fakir Mohan University, Balasore, in 2008; Bharathiar University, Coimbatore, in 2009; and Amity University, in 2010.

Dr Selvamurthy joined DRDO in 1973 and during the 36 years of service in DRDO, he has had a meritorious career and became the Director of DIPAS and DIPR in 1992. He made significant research contributions for the benefit of soldiers in fields related to physiological acclimatisation at high altitude, application of yoga for Armed Forces, discovery of a drug to save war casualties subjected to severe hemorrhage, psychological stress and its management, and life support systems for soldiers in extreme operational environments. He was Outstanding Scientist and Adviser at INMAS during 2002–03. Since 2003, he took over as CC R&D (Life Sciences & Human Resources).

Dr Selvamurthy has published 12 books and 170 research papers, which are widely cited. He is a fellow member of many national and international societies and organisations. He has been honoured with numerous awards: Technology Leadership Award (2010); Lifetime Achievement Award (2006-07) and Scientist of the Year Award (1989) by DRDO; Rastre Shresht Nidhi Award by Industrial Technology of India (2004); Dr P Brahmayya Sastry Memorial Award (2003); National Citizen’s Award by National Citizen’s Committee (2001); Shakuntala Amir Chand Award by ICMR (1986); and General Amir Chand Award by DGAFMS (1984).

Chief Controller R&D (Missiles and Strategic Systems)

Shri Avinash Chander, Distinguished Scientist, Programme Director, SFD and Director, Advanced Systems Laboratory (ASL) has assumed the charge of CC R&D (Missiles and Strategic Systems). He is an Eminent Scientist in the field of Missiles and is the Chief Designer of Long-Range Missile System in the country. He has successfully delivered three long-range weapon systems namely A1, A2 and A3.

Some of his management initiatives include technology mapping in strategic segments, Govt Owned Company Operated (GOCO) concept for production of critical inputs for missile systems. Concurrent production methodology to reduce developmental time cycles and identifying key technology growth areas.

He joined DRDO in 1972 after completing his graduation in Electrical Engineer from IIT Delhi. He obtained MS in Spatial Information Technology from JNTU, Hyderabad. He is a Fellow of Indian National Academy of Engineers and Convenor, Sub-Committee of Aerospace Section, Fellow of System Society of India, Fellow of Andhra Pradesh Academy of Sciences, Fellow and Vice-President of Astronautical Society of India and Chairman of INSARM & ISAMPE, Hyderabad Chapter. He has received numerous awards and honours in his career like DRDO Scientist of the Year Award (1989), Astronautical Society of India Award (1997) in the field of Rocketry, AGNI Self-Reliance Award (1999), Dr Biren Roy Space Science Award (2000), DRDO Award for Path-Breaking Research/Outstanding Technology Development (2007), Outstanding Technologist Award (2008) by Punjab Technical University, DRDO Technology Leadership Award (2008) and Outstanding contribution towards National Development Award (2011) by IIT, Delhi.
Chief Controller R&D (Aero)

Dr A Subhananda Rao, Distinguished Scientist and Director, HEMRL, has been appointed as Chief Controller R&D (Aero) w.e.f. 03 May 2011. He will also hold additional charge of Director, HEMRL, Pune.

Dr Rao is a gold medallist and has graduated (Mech. Engineering) from National Institute of Technology, Warangal. He obtained ME (Aeronautics) from IISc, Bengaluru, and received Roll of Honour. He had his doctorate from Osmania University, Hyderabad. He has over 86 technical publications to his credit published in various journals and published/presented in seminar/conference proceedings.

He is an acclaimed propulsion designer, and has designed, developed, realised, productionised, and evaluated more than 30 indigenous propulsion systems for strategic and tactical missiles. He has been associated with the development of propellant processing plants, infrastructure for testing and evaluation of solid propellant motors, and software for performance prediction of solid propulsion units. As Director HEMRL, he has successfully executed establishment of composite propellant processing plant for case-bonded rocket motors. Under his dynamic leadership, energetic super-elastic rocket propellants, modular charge system for gun ammunition, high-energy LOVA propellants, insensitive plastic-bonded explosive formulations, advanced anti-thermal anti-laser smoke grenades, flares for countermeasures, fuel air explosives, hybrid armour for tank protection, new insensitive molecules FOX-7 and TATB, were developed, tested and adopted for operational systems.

He has several awards and honours to his credit: Gold Shield Award for import substitution for surface-to-air missile SAM-II; Distinguished Alumni Award from NIT, Warangal; Samaj-Shri and Order of Merit from Indian Council of Management Executives; Scientist of the Year Award (2005), Spin-off Technology Award (2006), Titanium Trophy (2007), DRDO Performance Excellence Award (2007), Path Breaking Research/Outstanding Technology Development Award (2006 & 2007) all from DRDO; Distinguished Alumni Award (2008) IISC, Bangalore; and Special Award (2010) from DRDO for propellant manufacturing facility at Nasik.

Chief Controller R&D (Human Resources)

Dr V Bhujanga Rao, Distinguished Scientist, and Director, Naval Science and Technological Laboratory (NSTL), took over as Chief Controller R&D (Human Resources) at DRDO HQrs on 08 April 2011.

Dr Rao obtained post-graduation in Physics from Sri Venkateswara University, Tirupati in 1972; MS in Mechanical Engineering from Indian Institute of Science, Bangalore in 1986; Doctorate in Mechanical Engineering from Jawaharlal Nehru Technological University, Hyderabad in 1992 and in Technology Management from Devi Ahilya Visva Vidyalaya, Indore in 2002.

Dr Bhujanga Rao joined DRDO on 19 May 1973 at Defence Research and Development Laboratory (DRDL), Hyderabad, and later moved to NSTL on 08 July 1975. He has since served the organisation in various capacities. Dr Rao has specialised in warship technology, weapon hydrodynamics, weapon hydroballistics, submersible design, integrated naval stealth (acoustics, infrared, electromagnetics, shock, noise and vibration), and technology management.


Dr Rao has published more than 60 papers in both national/international journals/conferences. He is Fellow of National Academy of Engineering (1999), Fellow of Andhra Pradesh Akademi of Sciences (2010), and many other professional societies. He is Founder and President of Condition Monitoring Society of India. He was Visiting Scientist during 2003–04 and 2004–05 at School of Computational Science and Information Technology at Florida States University, USA. He is also a Honorary Professor of Mechanical Engineering, Andhra University College of Engineering (2010–2012).
DRDO Central Zone and National Ball Badminton Tournament

Shri K C h a n d r a S h e k a r, STA 'B', Shri Vittal K u m a r, Tech ‘B’, and Shri Venkatesh, Sec Attn ‘B’ from Centre for Air Borne Systems (CABS), Bengaluru, represented the DRDO South Zone Team and emerged winners in the DRDO Central Zone and National Ball Badminton Tournament conducted by Defence Electronics Research (DLRL), Hyderabad, during 15–18 March 2011.

Inter-Zonal Chess Tournament

Defence Scientific Information and Documentation Centre (DESIDOC), Delhi, organised an Inter-Zonal Chess Tournament during 22–25 March 2011. Sixteen players from central, north, south, and west zones participated in the four-day national tournament. Game events both for the individual and the team championship were conducted during the tournament. The winners of the tournament are: Shri TR Venugopal, central zone (Gold Medal) and Shri Durgesh Kumar, north zone (Silver Medal). The winners of the team championship are south zone (Gold Medal) and north zone (Silver Medal).

Visits to DRDO Labs/Estts

**CABS, Bengaluru**

Shri Nand Kishore, IDAS, CGDA, on 11 April 2011.

**CAIR, Bengaluru**

- Maj Gen Dr TS Handa, SM MGGS, Doctrine HQ ARTRAC and Shri H V Srinivasa Rao, Director, ISSA, on 07 March 2011.
- Maj Gen AK Srivastava, VSM, ADC, Tac C, on 29 March 2011.
The Editorial Team thanks all the DRDO Newsletter Correspondents for their contributions.

**HEMRL, Pune**

- Shri S Sundaresh, DS and CCR&D (ACE) on 15 April 2011.
- Air Vice Marshal AK Singh, VSM, ACAS (Weapons), Air HQrs accompanied by Gp Capt PM Puranik, VSM, DASE-A, and Wg Cdr SP Bhardwaj, JDASE (Lgs), on 15 March 2011.
- Lt Gen DS Sidhu, AVSM, VSM, DG MF, on 17 March 2011.

**ISSA, Delhi**

- Brig TSA Narayanan, Comdt SDD, MC EME, Secunderabad, on 07 April 2011.

**NPOL, Kochi**

- Vice Admiral Satish Soni, AVSM, NM, OSD to CNS, on 03 March 2011.

**LRDE, Bengaluru**

- Vice Admiral Ganesh Mahadevan, AVSM, VSM, Chief of Material (COM), on 28 April 2011.

**RAC, Delhi**

- Delegates from Canada under Image Building and S&T Collaboration Programme, on 28 February 2011.

**Commodore RB Pandit**, PDSR, Integrated Head Quarters of Ministry of Defence (Navy), on 05 March 2011.

**Commodore RB Pandit**, PDSR, Integrated Head Quarters of Ministry of Defence (Navy), on 05 March 2011.

**Brig Narayanan, showing keen interest in the war gaming systems.**

**VA Ganesh Mahadevan evincing keen interest in the NEMP test facility.**

**Delegates from Canada interacting with Director, RAC.**