

CSIO

वार्षिक प्रतिवेदन
Annual Report
2004-05



Central Scientific Instruments Organisation
Sector - 30, Chandigarh (India)

The Institute

Central Scientific Instruments Organisation (CSIO), a constituent unit of Council of Scientific & Industrial Research (CSIR), is a premier national laboratory dedicated to research, design and development of scientific and industrial instruments. It is a multi-disciplinary and multi-dimensional apex industrial research & development organisation in the country to stimulate growth of Instrument Industry in India covering wide range and applications.

Established in 1959 at Delhi, later moved to Chandigarh in 1962, CSIO has R&D Laboratories, Indo-Swiss Training Centre, Administrative Wing and a Housing Complex.

The R&D facilities are being continuously upgraded and modernized to the international standards in major areas of instrumentation covering mechanical, optical, electro-optical, electronics and IT solutions and providing technology based total solutions in Agriculture, Health, Defence, Strategic and Societal sectors. ISTC, started in 1963 through Swiss Foundation for Technical Assistance, Zurich, Switzerland, is a unique institution towards quality human resource generation and offering technological solutions in die and mould making using ultra-modern facilities.

Varieties of instruments have been developed in close association with apex bodies like Space, Defence & Health and know-hows have been transferred to the industries. Business Development Group and CSIO's 3 extension centres at Jaipur, Chennai & Delhi maintain close tie-ups with the industry for technological knowledge generation and dissemination.

Mission

- To be a leader at national level for designing and developing scientific and industrial instruments, instrument systems and devices
- To play a lead role in providing repair, maintenance & calibration services and training of instrument technologists
- To be a custodian of instrumentation activity in the country

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Title Page

**Cockpit view of
the Light
Combat Aircraft
(LCA) with
CSIO's HUD
installed**

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Annual Report

2004-05



केन्द्रीय वैज्ञानिक उपकरण संगठन
सैक्टर 30-सी, चण्डीगढ़-160 030 (भारत)

Central Scientific Instruments Organisation
Sector 30-C, Chandigarh-160 030 (India)

From Director's Desk



I am delighted to present CSIO's Annual Report for the year 2004-05 on its Foundation Day. During this period, my predecessor, Dr RP Bajpai laid down the office on 30th September, 2004 and I took over the reins of CSIO on 15th October, 2004 .

During the year, the Institute had the honour of having Shri Kapil Sibal, Hon'ble Minister of Science, Technology & Ocean Development and Vice-President, CSIR on 30th August, 2004. The Hon'ble Minister had a panoramic view of the activities of CSIO and was pleased to note CSIO's contribution to different sectors of the economy namely Strategic & Defence, Health, Rural Development, Natural Hazards Mitigation, Energy, Industry and HRD. In his address to the scientists, the Hon'ble Minister looked forward to Chandigarh becoming "Knowledge Centre" in this part of the country with CSIO playing stellar role towards that end.

The Hon'ble Minister also inaugurated the Fiber Grating Laboratory meant for the development of technology for direct writing of different types of Fiber Bragg Gratings (FBGs) and Long Period Gratings (LPGs) for communication and sensor applications.

Later in March 2005, the Institute was privileged to have Dr RA Mashelkar, FRS, Secretary to Govt. of India and Director General, CSIR. During his unscheduled and brief visit, Dr Mashelkar evinced

keen interest in the new initiatives launched by CSIO. Dr Mashelkar also enlightened a couple of scientists to lay thrust on outcomes rather than on outputs so that society could derive benefit from the newer developments in Science & Technology.

Having been nurtured in the CSIR system for the last nearly 30 years and having had the privilege of visiting several R&D labs within the Country and abroad, I can say it with pride that CSIO is one of the finest labs I have come across. This multi-disciplinary Institution with wide ranging expertise in different domains has immense potential which if channelised properly could enable CSIO reach newer heights. CSIO has all the attributes to even become one of the front ranking laboratories internationally. Therefore, in order to harness CSIO's potential, I, alongwith my colleagues and through the guidance and direction provided by the Hon'ble Chairman and Members of the Research Council, initiated action towards generating the Road Map 2005-10 for CSIO. The Road Map, besides consolidating CSIO's expertise in different domains, shall bring about more focus in key R&D areas in due course and shall enable CSIO to become a leader in some of these areas. As a strategy towards that end, a new structure around "Decision Unit" concept was also evolved. The transformation is meant to provide more autonomy to R&D groups and hence move CSIO in a well steered direction.

From Director's Desk

In terms of its R&D accomplishments, CSIO continued to make discernible impact.

In Agro based Instrumentation, monitoring of moisture content in grains, cereals, fertilizers, tea, tobacco is important for their storage and quality. CSIO successfully developed a digital moisture probe for application in grain markets. Since unlevelled agricultural fields need more water for irrigation after ploughing, CSIO's development of laser guided land leveling system aims at optimizing utilization of water resources, increased productivity with a radial distance coverage of 150 m without sunlight.

Bamboo is an economic resource for sustainable development and livelihood particularly in the North-east. Therefore, considered as 'Green Gold', Govt. of India has launched a National Mission on Bamboo Technology and Trade Development. CSIO, in its endeavour to serve this sub-sector, successfully developed low cost bamboo processing machines - Bamboo Knot Removing & Slivering Machine and Bamboo Splitting Machine. The machines will find wide spectrum of applications wherein bamboo is the raw material.

In Medical Instrumentation, development of first indigenous 6 MeV Medical Linear Accelerator developed through collaborative efforts of CSIO, SAMEER and PMT was almost brought to its successful conclusion. The machine, developed through sponsorship of the Department of Information Technology under Jai Vigyan Programme of Govt. of India, will be installed at Mahatma Gandhi Institute of Medical Sciences, Wardha. It is well established now that cure rate of cancer afflicted patients through Medical Linear Accelerator is far better than that by Cobalt machine besides the other concomitant advantages of the former.

Having established its credentials in Cockpit Instrumentation particularly for combat aircrafts, Hindustan Aeronautics Limited (HAL), Bangalore reposed its confidence in CSIO by sponsoring the development of Head Up Display for Hindustan Jet Trainer (HJT) and Advanced Jet Trainer (AJT) aircrafts. Besides reduction in weight and volume, this HUD will incorporate Electronic Stand by Sight (SBS) feature to guide the pilot for combating and landing in case of mission computer failure.

During AERO INDIA -2005, the airshow held in

Bangalore during February 2005, CSIO's HUD was installed in TD-2 and PV-1 combat aircrafts. Shri Pranab Mukherjee, Hon'ble Minister of Defence in the Union Cabinet evinced keen interest in the successful indigenous development. It is gratifying to note that during the period, CSIO's HUD had been successfully flown in more than 400 flights.

Yet another milestone in the area was successful development of fire safety sensors of the combat aircrafts to check sudden overheating of the engine or any other system. The development complied with the required qualification test of MIL grade specifications.

Analytical Instrumentation has been the mainstay of CSIO. The Real Time Sound Analyzer ready for technology transfer monitors noise intensity so as to evolve means to bring it within threshold levels.

The Microcontroller based Coefficient of Haze and Dust Mass Monitor developed is useful to assess dust concentration in air which is one of the key parameters in Index of the Quality of Air (IQUA).

In Energy Management Instrumentation, "Online Energy Monitoring and Control System (EMCS)" developed under a programme sponsored by DST was commissioned at Boiler Auxiliaries Plant of Bharat Heavy Electricals Ltd. (BHEL), Ranipet. The system resulted in significant energy savings in the production units. The Chairman-cum-Managing Director of BHEL while appreciating the Energy Management System developed by CSIO has advised to initiate similar efforts at 14 other BHEL units in collaboration with CSIO.

Oscillation Monitoring System (OMS) developed under the support of RDSO, Lucknow is useful in assessing safety of railway tracks and vehicles. An engineered model of OMS was handed over to RDSO for performance trials which gave comparable results as obtained by Track Recording Coach being currently used by Indian Railways.

It is heartening to report that CSIO scientists are becoming increasingly conscious of IPR and publications. During the year, three foreign patents were granted and 26 were filed, including 14 abroad apart from publications in journals with a reasonably good Impact Factor.

In any R&D organization, continuous upgrading of its infrastructural facilities is an ongoing process to ation

From Director's Desk

maintain relevance. During the period, the facility of Scanning Probe Microscope which is combination of various modes of Atomic Force Microscopy and Scanning Tunneling Microscopy was created. The facility is immensely useful for manipulation of carbon nanotubes (CNTs) and DNA to study their mechanical and electrical properties. Yet another facility added was that of Fluorescence Spectrophotometer which is used for determination of metal ions as fluorescent organic complexes. Important applications are in determination of quinine, vitamins, etc. and elements like Al, Ca, Zn etc. which are present in water and soils.

The year also saw spurt in business development activities. A CSIO-Industry Meet organized jointly with Rajasthan State Industrial Development and Investment Corporation Ltd. (RIICO) at Jaipur for promotion of agro-based instrumentation was an astounding success. The meet paved way for an MoU for the creation of three agro-test laboratories in the food parks being established by RIICO.

Owing to CSIO's expertise in high precision Single Point Diamond Turning (SPDT) and precision metrology for super precision components, an MoU was signed with BARC, Mumbai for undertaking feasibility study for development of super precision components with nanometric finish.

Govt. Medical College-cum-Hospital (GMCH), Chandigarh has been encouraging development of medical instruments at CSIO through participation of their faculty and also in conducting clinical evaluation of these instruments. In order to run their B.Sc (Ophthalmic Techniques) course, GMCH entered into MoU with CSIO for providing teaching faculty besides using facilities for hands-on-sessions on ophthalmic optics.

The Indo-Swiss Training Centre (ISTC) under CSIO received a shot in the arm when the National Board of Accreditation (NBA) awarded accreditation status to the three diploma level programmes being regularly conducted. These are: Advanced Diploma in Mechatronics & Industrial Automation, Advanced Diploma in Die & Mould Making and Diploma in Instrument Technology. It was gratifying to note cent percent placement of the passing out graduates thus

Chandigarh
30th October, 2005

demonstrating the credibility of the Institute in the industry.


The Outreach Centres of CSIO besides undertaking repair, maintenance & calibration services also conducted as many as 14 training programmes on preventive maintenance of bio-medical instruments for hospital technicians and doctors in different parts of the Country. These Centres have been reoriented to act as business development outfits for CSIO.

We have no words to express our deep gratitude to the users, industry, academic and research institutions particularly ADA, HAL, RIICO, DST, DIT, DBT who reposed full confidence in CSIO's capabilities by sponsoring various R&D programmes. This only demonstrates CSIO's expertise and strength backed by determination to accept challenging tasks and quest for quicker deliverance.

The laboratory's all round contribution was because of the sustained, incessant and painstaking efforts put in by all my colleagues. The relations among scientific, technical and yard staff have been more than cordial with the latter always rendering a helping hand. I acknowledge their efforts which enabled CSIO to forge ahead.

It is our privilege to express our profound gratefulness to Director General, CSIR, Dr. R.A. Mashelkar, FRS and the team at CSIR Headquarters for their constant help, encouragement and backstopping support. Continuous guidance provided by Chairman of the Research Council, Dr Kota Harinarayana and Hon'ble Members is noteworthy which is inspiring us to take up new challenges.

Instrumentation as an area is all pervading. The present day 'mantra' is not just developing discrete instrumentation for different applications but offering technology based total solutions among diverse users. Being a multi-disciplinary organization, CSIO, with its integrated team of dedicated scientists & other staff and backed by its state-of-art facilities and successful track record is gearing itself to the new scenario so that in due course it truly dons the cap - 'Custodian of Instrumentation'. The years to come shall, therefore, see CSIO making indelible and visible impact through outcomes of its outputs to reach the aspired newer heights.



(Pawan Kapur)
Director



मुझे सीएसआइओ के स्थापना दिवस के अवसर पर संगठन की वर्ष 2004-05 की वार्षिक रिपोर्ट प्रस्तुत करते हुए बहुत प्रसन्नता हो रही है। इस अवधि में मेरे पूर्ववर्ती डॉ. राम प्रकाश बाजपेयी 30 सितंबर, 2004 को निदेशक पद से कार्यमुक्त हुए और मैंने 15 अक्टूबर, 2004 को इस पद पर कार्यभार संभाला।

वर्ष के दौरान माननीय विज्ञान एवं प्रौद्योगिकी तथा महासागर विकास मंत्री और उपाध्यक्ष, सीएसआइआर श्री कपिल सिब्बल जी ने 30 अगस्त, 2004 को संगठन का दौरा किया। माननीय मंत्री महोदय ने संगठन के कियाकलापों को देखा और उन्होंने सामरिक व सुरक्षा, स्वास्थ्य, ग्रामीण विकास, प्राकृतिक आपदा नियंत्रण, ऊर्जा, उद्योग एवम् मानव संसाधन विकास जैसे अर्थ-व्यवस्था के विभिन्न क्षेत्रों में सीएसआइओ के योगदान पर प्रसन्नता व्यक्त की। वैज्ञानिकों को संबोधित करते हुए माननीय मंत्री महोदय ने सीएसआइओ द्वारा निभाई जा रही महत्वपूर्ण भूमिका के दृष्टिगत देश के इस भाग में चण्डीगढ़ नगर के 'ज्ञान का केन्द्र' बनने की आशा व्यक्त की।

श्री सिब्बल ने विभिन्न प्रकार के फाइबर ब्रैग ग्रेटिंग्स एवम् लॉग पीरियड ग्रेटिंग्स की सीधी राइटिंग के लिए प्रौद्योगिकी विकास हेतु फाइबर ग्रेटिंग प्रयोगशाला का उद्घाटन भी किया। इन ग्रेटिंग्स का प्रयोग संचार एवं संवेदी अनुप्रयोगों

के क्षेत्र में किया जाएगा।

तदुपरांत मार्च, 2005 में संगठन को डॉ. रघुनाथ अनंत माशोलकर, एफआरएस, सचिव, भारत सरकार और महानिदेशक, सीएसआइआर के आतिथेय का अवसर प्राप्त हुआ। अपने इस आकस्मिक एवं संक्षिप्त दौर के दौरान डॉ. माशोलकर ने संगठन द्वारा नई दिशाओं में किए जा रहे प्रयासों में गहरी रूचि दिखाई। डॉ. माशोलकर ने कुछ वैज्ञानिकों का मार्गदर्शन करते हुए उन्हें आउटपुट की तुलना में आउटकम पर ध्यान केन्द्रित करने का सुझाव दिया, जिससे कि विज्ञान एवं प्रौद्योगिकी के क्षेत्र में नए विकास कार्यों से समाज लाभान्वित हो सके।

लगभग 30 वर्षों तक सीएसआइआर व्यवस्था से जुड़े होने और देश और विदेश में अनेक अनुसंधान एवं विकास कार्यों में जुटी प्रयोगशालाओं को देखने का सुअवसर प्राप्त करने के बाद मैं यह गर्व के साथ कह सकता हूँ कि संगठन श्रेष्ठ प्रयोगशालाओं में से एक है।

विविध क्षेत्रों में कार्य करने एवं विशेषज्ञता रखने वाले इस संस्थान में असीम संभावनाएं हैं। इनका उपयुक्त प्रकार से प्रयोग कर सीएसआइओ निश्चित ही नवीन ऊंचाइयों को प्राप्त कर सकता है। संगठन में अन्तरराष्ट्रीय प्रयोगशालाओं में अग्रणी स्थान प्राप्त करने की समस्त विशेषताएं उपलब्ध हैं। अतः संगठन की इन संभावनाओं को साकार करने के

लिए मैंने अपने सहकर्मियों के साथ मिलकर अनुसंधान परिषद् के माननीय अध्यक्ष एवं सदस्यों के मार्गदर्शन में संगठन के लिए वर्ष 2005-10 का रोड-मैप तैयार करने की दिशा में कार्य प्रारंभ किया। यह रोड-मैप विभिन्न क्षेत्रों में संगठन की विशेषज्ञता को संघटित करने के अतिरिक्त प्रमुख अनुसंधान एवं विकास क्षेत्रों को शीघ्र ही अधिक लक्ष्यपरक बनाएगा और इससे संगठन कुछ क्षेत्रों में अग्रणी स्थान प्राप्त कर सकेगा। उस लक्ष्य के लिए योजना तैयार करते समय संगठन की "निर्णय एकक (Decision Unit)" के सिद्धांत पर आधारित नई संरचना की गई। इस नवीन व्यवस्था का उद्देश्य अनुसंधान एवं विकास समूहों को अधिक स्वायत्तता प्रदान करना और परिणामतः संगठन को एक सुनिश्चित दिशा में अग्रसर करना है।

अनुसंधान एवं विकास उपलब्धियों की दृष्टि से संगठन की सामर्थ्य का प्रत्यक्ष प्रभाव इस वर्ष भी बना रहा।

कृषि आधारित उपकरण विन्यास के संबंध में, दलहन, तिलहन, उर्वरक, चाय, तंबाकू आदि के भंडारण एवं गुणवत्ता के लिए नमी की मात्रा की निगरानी करना अत्यंत महत्त्वपूर्ण है। इस संबंध में सीएसआइओ ने खाद्यान्न बाजारों में प्रयोग के लिए डिजिटल मॉयस्चर प्रोब का सफल विकास किया गया। चूंकि खेत में हल चलाने के बाद असमतल भूमि में सिंचाई के लिए अधिक पानी की आवश्यकता होती है, इसलिए सीएसआइओ द्वारा निर्मित भूमि को समतल बनाने के लिए लेज़र नियंत्रित प्रणाली का लक्ष्य जल संसाधनों का अधिकतम प्रयोग करना और 150 मीटर की परिधि में बिना सूर्य की रोशनी के उत्पादकता को बढ़ाना है।

बांस विशेष रूप से उत्तर पूर्व में स्थायी विकास एवम् आजीविका के लिए एक आर्थिक स्रोत है। इसलिए इसे हरित स्वर्ण मानते हुए भारत सरकार ने बांस प्रौद्योगिकी एवं व्यवसाय विकास पर एक राष्ट्रीय मिशन प्रारंभ किया है। इस उप-क्षेत्र में कार्य करने के अपने प्रयास में सीएसआइओ ने सफलतापूर्वक कम कीमत की बांस प्रक्रमण मशीनों का विकास किया है। ये मशीनें हैं : बैबू नॉट रिमूविंग एंड स्लाइवरिंग मशीन और बैबू स्प्लिटिंग मशीन। कच्ची सामग्री के रूप में बांस के लिए इन मशीनों के व्यापक प्रयोग होंगे।

चिकित्सा उपकरण विन्यास के क्षेत्र में सीएसआइओ, समीर और पीएमटी के संयुक्त प्रयासों द्वारा प्रथम स्वदेशी 6 एमईवी मैडिकल लीनियर एक्सलरेटर के विकास कार्य को सफलतापूर्वक संपन्न किया गया। भारत सरकार के जैव विज्ञान कार्यक्रम के अंतर्गत सूचना प्रौद्योगिकी विभाग से प्राप्त आर्थिक सहयोग से विकसित इस मशीन को महात्मा गांधी चिकित्सा विज्ञान संस्थान, वर्धा में लगाया जाएगा। अब यह पूर्ण रूप से प्रमाणित हो चुका है कि मैडिकल लीनियर एक्सलरेटर से कैंसर रोगियों के उपचार की दर, अन्य लाभों के साथ-साथ, कोबाल्ट मशीन की तुलना में कहीं अधिक है।

कॉकपिट उपकरण विन्यास के क्षेत्र में, विशेष रूप से लड़ाकू विमानों के लिए, अपनी विश्वसनीयता बना लेने के बाद अब एचएएल, बेंगलूर ने संगठन में पुनः विश्वास व्यक्त करते हुए हिंदुस्तान जैट ट्रेनर (एचजेटी) और एडवांस्ड जैट ट्रेनर (एजेटी) विमानों के लिए हैड-अप डिस्प्ले (हड) के विकास की परियोजना प्रायोजित की है। भार और आकार में कम होने के अतिरिक्त इस हड में युद्ध क्षेत्र में मिशन कम्प्यूटर के खराब हो जाने पर पायलट के मार्गदर्शन और विमान को उतारने के लिए इलैक्ट्रॉनिक स्टैंड बाय साइट (एसबीएस) की विशेषताएं भी होंगी।

फरवरी, 2005 में बेंगलूर में हुए एयर-शो 'एरो इंडिया - 2005' में सीएसआइओ द्वारा विकसित हड को टीडी-2 और पीवी-1 लड़ाकू विमानों में लगाया गया। माननीय केन्द्रीय रक्षा मंत्री श्री प्रणव मुखर्जी ने स्वदेश में सफलता पूर्वक विकसित इस प्रौद्योगिकी में गहरी रूचि दिखाई। यह अत्यंत प्रसन्नतादायक है कि रिपोर्ट की अवधि के दौरान संगठन द्वारा विकसित हड को 400 से अधिक उड़ानों में सफलतापूर्वक प्रयुक्त किया गया।

लड़ाकू विमानों में इंजन अथवा किसी अन्य प्रणाली का अकस्मात तापमान बढ़ जाने की जांच के लिए अग्नि सुरक्षा संवेदियों का विकास इस क्षेत्र में संगठन की एक अन्य उल्लेखनीय सफलता है। यह विकास कार्य एमआइएल ग्रेड विशिष्टियों के अनुरूप किया गया है।

विश्लेषणात्मक उपकरण विन्यास संगठन का प्रमुख क्षेत्र रहा है। रियल टाइम साउंड एनालाइज़र ध्वनि की तीव्रता

को मॉनीटर करता है, जिससे कि इसे अपेक्षित स्तर तक लाया जा सके, यह उपकरण प्रौद्योगिकी हस्तांतरण के लिए तैयार है।

सूक्ष्म नियंत्रक पर आधारित एक अन्य उपकरण कोएफिशिएंट ऑफ हेज एंड डस्ट मास मॉनीटर वायु में धूल की सांद्रता के मापन के लिए उपयोगी है, जो कि वायु की गुणवत्ता के मापन (आइक्यूयूए) में एक महत्वपूर्ण परिमाणक है।

ऊर्जा प्रबंधन उपकरण विन्यास के क्षेत्र में डीएसटी द्वारा वित्त प्राप्त एक कार्यक्रम के अंतर्गत विकसित 'ऑन लाइन एनर्जी मॉनीटरिंग एंड कंट्रोल सिस्टम' को बीएचईएल के रानीपेट स्थित बाँयलर ऑक्सीलरीज प्लांट में सफलतापूर्वक चालू किया गया। इस प्रणाली से उत्पादन इकाइयों में ऊर्जा की उल्लेखनीय बचत में सहायता प्राप्त हुई। बीएचईएल के अध्यक्ष एवं प्रबंध निदेशक ने सीएसआइओ द्वारा विकसित ऊर्जा प्रबंधन इकाई की प्रशंसा करते हुए संगठन के सहयोग से बीएचईएल की अन्य 14 इकाइयों में भी ऐसे ही प्रयास प्रारंभ करने की भी सिफारिश की।

संगठन में विकसित ऑसिलेशन मॉनीटरिंग सिस्टम (ओएमएस) रेलवे पटरियों और वाहनो की सुरक्षा के मूल्यांकन के लिए अत्यधिक उपयोगी है। इसके लिए वित्तीय सहायता आरडीएसओ, लखनऊ से प्राप्त हुई। ओएमएस की एक पूर्ण तैयार इकाई परीक्षणों के लिए आरडीएसओ को दी गई। भारतीय रेलवे द्वारा वर्तमान में प्रयुक्त किए जा रहे ट्रैक रिकॉर्डिंग कोच की तुलना में इसके परिणाम बेहतर पाए गए।

यह अत्यंत प्रसन्नता की बात है कि संगठन के वैज्ञानिक आइपीआर और प्रकाशनों के संबंध में अधिकाधिक जागरूक हो रहे हैं। वर्ष के दौरान 3 विदेशी पेटेंट ग्रांट हुए और 26 फाइल किए गए, जिनमें से 14 विदेशों में फाइल हुए। इनके अतिरिक्त संगठन के वैज्ञानिकों के शोध-पत्र अच्छे इम्पैक्ट फैक्टर वाली शोध पत्रिकाओं में प्रकाशित हुए।

किसी भी अनुसंधान एवं विकास संगठन में मूल ढांचा सुविधाओं को निरंतर उन्नत करते रहना प्रासंगिकता को

बनाए रखने के लिए एक सतत् चलने वाली प्रक्रिया है। रिपोर्ट की अवधि के दौरान स्कैनिंग प्रोब माइक्रोस्कोप की सुविधा स्थापित की गई, जो एटोमिक फोर्स माइक्रोस्कोपी और स्कैनिंग टनलिंग माइक्रोस्कोपी के विविध प्रकारों का संयुक्त रूप है। यह सुविधा कार्बन नैनो ट्यूब्स और डीएनए के यांत्रिक एवं वैद्युत गुणों के अध्ययन में अत्यधिक उपयोगी है। इसी अवधि में ही फ्लोरीसैंस स्पैक्ट्रोफोटोमीटर की सुविधा भी उपलब्ध करवाई गई, जो धातु आयनों के निर्धारण में उपयोगी होती है। पानी और मिट्टी में कुनीन, विटामिन इत्यादि और एल्युमिनियम, कैल्शियम, जिंक इत्यादि जैसे तत्त्वों का निर्धारण इस सुविधा का एक अन्य महत्वपूर्ण प्रयोग है।

वर्ष के दौरान व्यवसाय विकास क्रियाकलापों में भी तेज़ी आई। संगठन ने जयपुर में राजस्थान राज्य औद्योगिक विकास एवम् निवेश निगम लि. (रीको) के साथ संयुक्त रूप से सीएसआइओ-उद्योग सम्मेलन का आयोजन किया। यह सम्मेलन कृषि आधारित उपकरण विन्यास को बढ़ावा देने के अपने उद्देश्य में अत्यधिक सफल रहा। इसके परिणामस्वरूप संगठन ने रीको द्वारा बनाए जा रहे फूड पार्क्स में 3 कृषि आधारित प्रयोगशालाओं की स्थापना के लिए रीको के साथ एक समझौते पर हस्ताक्षर किए गए।

परा-परिशुद्ध संघटकों के लिए उच्च परिशुद्धता वाले सिंगल प्वाइंट डायमंड टर्निंग (एसपीडीटी) एवं प्रिसीज़न मैट्रोलॉजी में संगठन की विशेषज्ञता के दृष्टिगत नैनो मीट्रिक सरफेस फिनिश सहित सुपर प्रिसीज़न संघटकों के विकास के संभाव्यता अध्ययन हेतु बार्क, मुंबई के साथ एक समझौता ज्ञापन हुआ।

राजकीय चिकित्सा कॉलेज एवं अस्पताल (जीएमसीएच), चण्डीगढ़ संगठन को चिकित्सा उपकरणों के विकास हेतु निरंतर प्रोत्साहित करता रहता है। इस कार्य में उनके संकाय सदस्यों की भागीदारी तो रहती ही है, इसके अतिरिक्त विकसित उपकरणों का अस्पताल में मूल्यांकन करने में भी जीएमसीएच सहयोग देता है। उनके बीएस. सी. कोर्स (ऑप्टिकल तकनीकें) को चलाने के लिए जीएमसीएच एवं सीएसआइओ के बीच एक समझौता हुआ है, जिसके अंतर्गत संगठन द्वारा अध्यापन संकाय प्रदान करने के रिक्

साथ-साथ आथ्रैलमिक प्रकाशिकी के व्यावहारिक प्रशिक्षण के लिए सुविधाएं प्रदान की जाएंगी।

संगठन के इण्डो-स्विस प्रशिक्षण केन्द्र के तीन डिप्लोमा स्तरीय कार्यक्रमों को रिपोर्ट की अवधि के दौरान एनबीए से मान्यता प्राप्त होना केन्द्र की एक अन्य गौरवपूर्ण उपलब्धि है। यह डिप्लोमा कोर्स है : एडवांस्ड डिप्लोमा इन मैकैट्रॉनिक्स एंड इंडस्ट्रियल ऑटोमेशन ; एडवांस्ड डिप्लोमा इन डार्ड एंड मोल्ड मेकिंग ; तथा एडवांस्ड डिप्लोमा इन इंड्रियुमैट टेक्नोलॉजी। इस वर्ष केन्द्र के समस्त उत्तीर्ण प्रशिक्षणार्थियों को नौकरी मिल जाना केन्द्र के लिए गौरव की बात तो है ही, इसके साथ ही इससे उद्योगों में संस्थान की विश्वसनीयता भी प्रमाणित होती है।

संगठन के बाह्य केन्द्रों ने मरम्मत, अनुरक्षण और अंशांकन की सेवाएं प्रदान करने के अतिरिक्त देश के विभिन्न भागों में अस्पतालों के तकनीशियनों और डॉक्टरों को जैव-चिकित्सा उपकरणों के रख-रखाव का प्रशिक्षण देने के लिए 14 प्रशिक्षण कार्यक्रम आयोजित किए। इन केन्द्रों को संगठन के लिए व्यावसाय विकास इकाइयों के रूप में चलाया जा रहा है।

हम प्रयोक्ताओं, उद्योगों, शिक्षा और अनुसंधान संस्थानों, विशेष रूप से एडीए, एचएएल, रीको, डीएसटी, डीआईटी, डीबीटी के प्रति आभार को शब्दों में व्यक्त करने में असमर्थ हैं, जिन्होंने अनुसंधान एवं विकास कार्यक्रमों को प्रायोजित कर सीएसआइओ में विश्वास दिखाया। यह संगठन की विशेषज्ञताओं एवं शक्तियों के साथ-साथ संगठन के चुनौतीपूर्ण कार्यों को स्वीकार करने के दृढ़ निश्चय एवम् शीघ्र परिणाम देने की अभिप्सा को दर्शाता है।

चण्डीगढ़

30 अक्टूबर, 2005

प्रयोगशाला का यह सर्वमुखी योगदान मेरे समस्त सहकर्मियों के निरंतर, स्थायी एवं श्रमसाध्य प्रयासों का परिणाम है। वैज्ञानिक, तकनीकी एवम् सहयोगी स्टाफ के परस्पर संबंध अत्यंत सौहार्दपूर्ण एवं सहयोगपूर्ण रहे हैं। मैं उनके प्रयासों की सराहना करता हूँ, जिससे कि संगठन विकास की दिशा पर अग्रसर हो सका।

महानिदेशक, सीएसआइआर डॉ. रघुनाथ अनंत माशेलकर, एफआरएस एवम् सीएसआइआर मुख्यालय टीम के प्रति हार्दिक व्यक्त करना हमारा विशेष दायित्व है, जिनसे हमें निरंतर सहायता, प्रोत्साहन एवं विशेष सहयोग प्राप्त होता रहा है। अनुसंधान परिषद के माननीय अध्यक्ष डॉ. कोटा हरिनारायण एवं सदस्यों से प्राप्त सतत् मार्गदर्शन हमें नवीन चुनौतियों की ओर अग्रसर होने में उल्लेखनीय रूप से प्रोत्साहित करता रहा है।

उपकरण विन्यास एक विधा के रूप में सर्व-व्याप्त है। वर्तमान समय का मूल मंत्र विभिन्न प्रकार के प्रयोगों के लिए विविध उपकरण विकसित करना ही नहीं अपितु विविध प्रयोक्ताओं को प्रौद्योगिकी आधारित संपूर्ण समाधान प्रदान करना भी है। बहुमुखी संस्थान होने के नाते सीएसआइओ अपने समर्पित वैज्ञानिकों एवं अन्य स्टाफ की टीम के साथ उपलब्ध अत्यधुनिक सुविधाओं तथा सफल रिकॉर्ड के आधार पर नवीन परिदृश्य की ओर अग्रसर है, जिससे कि शीघ्र ही इसे 'उपकरण विन्यास के संरक्षक' के रूप में मान्यता प्राप्त हो सके। इस प्रकार आने वाले वर्षों में सीएसआइओ अपनी उपलब्धियों के परिणामों के अमिट एवं स्पष्ट प्रभाव छोड़ते हुए नव्य ऊँचाइयों को प्राप्त करेगा।

Wan Singh

(पवन कपूर)

निदेशक



R & D Activities and Achievements

- **Agro & Geo-Scientific Instrumentation**
- **Medical Instrumentation & Intelligent Prosthetic Devices for Disabled**
- **Cockpit Instrumentation and Opto-Mechanical Systems**
- **Fiber / Laser Optics based Instrumentation**
- **Analytical Instruments & MEMS**
- **Advanced Materials based Transducers**



Agro & Geo-Scientific Instrumentation

India continues to be an agrarian economy with the responsibility to feed a very large population residing over a vast land of varied agro-climatic conditions. Also, the country's landmass and the surrounding waters are prone to almost all kinds of natural and man made hazards viz. earthquakes, landslides, snow avalanche, cyclones, floods etc. In such a scenario, CSIO has been playing a stellar role for development of instrumentation for agricultural applications and to monitor the seismic & other hazardous activities. A Group in the Institute is actively working to address these issues.

The basic objectives of this Group are to cater to the research & development activities pertaining to agro & geo-seismic fields. Following are the major R&D programmes of the Group:

- Intelligent Instrumentation for Agro-based Industry
- Instrumentation for Geo-sciences and Disaster Mitigation
- Condition Monitoring Instrumentation
- Instrumentation for Railway Safety

INTELLIGENT INSTRUMENTATION FOR AGRO-BASED INDUSTRY

Various technological innovations undertaken in the past through green, white and yellow revolutions have gone a long way in improving the agricultural production in this country. New issues of demand and supply, post harvest storability, resistance to aflatoxin, seed dormancy, storage life and tolerance to pests are required to be addressed. The present day need is to provide technological solutions based on advanced instrumentation for improving agricultural productivity, both at pre-harvest as well as at post-harvest stages besides facilitating quantification of quality.

Agro-based activities are broadly classified in three categories: field level work, storage & processing, and quality assessment (mandis). All these sectors need modernization through development of application specific sensors/ transducers, monitoring and control instrumentation, virtual instrumentation, networking and intelligent machine development for quantification of quality.

CSIO has been actively engaged, over the years, for the development of instruments used in agriculture and related industry. Some of these instruments e.g. Hand-held Soil pH Meter, Aflatoxin Meter, Near Infrared based Grain Parameters Monitor and Liquid Dispensing System have made indelible impact in this area. R&D activities were carried out in the following broad areas:

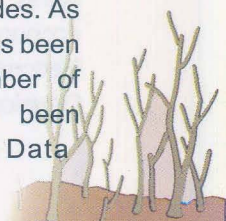
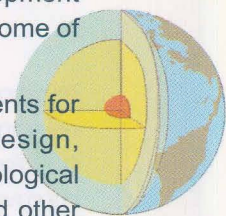
- Intelligent stand-alone instruments and integrated systems for analysis and quantification of quality in respect of agricultural produce such as rice, grain, etc.
- New transduction techniques for agro-climatic monitoring
- Instrumentation for storage of food under controlled atmosphere

Besides this, CSIO is the Nodal Laboratory for CSIR Networked Project on Electronics for Societal Purposes. Coordinated efforts amongst the various CSIR laboratories (CSIO, CEERI, CMERI, CFTRI, CRRI, CBRI, NGRI, NPL) are being made. Development of Electro-optical System for sorting, grading, packaging & storage of agricultural products, Prosthetic Instrumentation & Medical Instruments, Calibration and Instrumentation for natural hazards monitoring & early warning systems were the major R&D components pursued.

GEO-SEISMIC INSTRUMENTATION

The impact of hazards such as earthquakes, landslides, snow avalanche, cyclones, floods, etc. is enormous as these cause wide spread destruction and damage to human life and property. In view of this, investigations of seismic activities and development of instrumentation for their monitoring has become of prime importance.

Realizing the strategic need of these instruments for India, CSIO has been engaged in design, development and batch production of seismological instruments, snow avalanche instruments and other geophysical instruments for the last two decades. As a result, a good infrastructure and expertise has been created in this important area and a number of instruments of national importance have been developed. These include 24-bit Seismic Data



Agro & Geo-Scientific Instrumentation

Acquisition System, 16 bit Seismic Data Recorder & Analyzer, Force Balance Accelerometer, IR based Snow Surface Temperature Measuring Probe, Multiuser Field Operated Data Recorder & Analyzer for Geo-technical Application and Intelligent Data Logger for processing & recording of various snow parameters. In addition, a network of three seismological observatories has been established at Chandigarh and in Himachal Pradesh at Nauni (Solan) and Sunder Nagar to study the seismicity in and around Chandigarh for earthquake monitoring.

CONDITION MONITORING INSTRUMENTATION

Condition monitoring of industrial machinery is significantly important for predicting the machine health as evident from the current global trends where the emphasis in machine servicing has shifted from preventive to predictive maintenance. In view of this, CSIO has been very active in this area and a DST collaborative project on "Condition Monitoring of Rotating Machinery for Thermal Power Plant" was successfully completed. The system was installed at GGS Super Thermal Power Plant, Ropar and had the following features:

- Based on Vibration Signature analysis
- Monitors, detects and predicts faults & their nature
- Robust on-line expert system having artificial

neural network

This would further facilitate:

- Condition monitoring of boilers and prime movers in sugar industry
- On board diagnostics for railway engines
- Vibration monitoring sensors for heavy rotating machines

INSTRUMENTATION FOR RAILWAY SAFETY

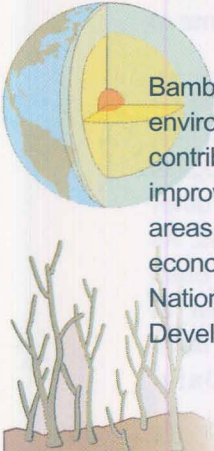
Adoption of preventive measures for avoiding railway accidents is the need of the day. The Institute has been working in this area for quite some time and an Oscillation Monitoring System for railway safety has been developed which is currently being evaluated at RDSO, Lucknow. Further, RDSO has also shown keen interest for development of the following instruments/ systems for railway safety:

- Derailment Detection Device/ System
- Fog Vision Instrumentation
- Measuring Wheel Technology
- Track Side Bogie Monitoring System

Besides developing the following technologies during the year, some of the technologies developed earlier were also popularized (in project mode using funding from TMOP&M) so as to put the low cost indigenous technologies to the end user i.e. farmers.

Technologies developed and ready for know-how transfer are:

BAMBOO PROCESSING MACHINES



Bamboo, the 'Green Gold', with its multiple effects on the environment and its potential as an economic resource is contributing significantly to sustainable development and improvement of livelihood security both in urban & rural areas. Recognizing the importance of bamboo & its economic potential, the Govt. of India has launched a National Mission on Bamboo Technology and Trade Development under which one of the important

components is to develop the technology of Low Cost Machines specific to Indian Bamboo for manufacturing a range of bamboo products.

Keeping this in view, work was pursued at CSIO for development of low cost machines for processing Indian bamboo. The following machines have been designed & developed:

Agro & Geo-Scientific Instrumentation

Bamboo Splitting Machine

In House Project

Generally bamboo is split by circular hand tool using wooden mallets and is slivered to specific thickness depending upon the utility usage. Mechanized tools are rarely available as size, shape and quality of the bamboos differ from place to place and even the same

vertically over the bamboo culm matching the center of the culm with that of splitter, which is then pushed down for thin walled culm. A wooden mallet is used to drive the splitter through the bamboo for thick walled culm. In a mechanical radial splitter developed at



Bamboo Splitting Machine

species grown at different places do not have the same characteristics. The machine developed at CSIO thus caters to nearly all varieties of bamboos. The mechanism is simple and versatile as it is to be used in the remote & hilly areas. It could be operated by an unskilled labour & can be maintained at site

CSIO, a conical shaped splitting tool cross cuts the bamboo pole of 1.2 m length horizontally by a powered movement of chain mechanism and instantly splits it into a number of sections as desired. This splitting machine is suitable for Indian species, cheaper in cost and improves productivity.

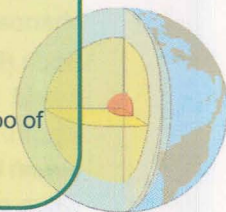
DESCRIPTION

Sectorally split bamboo of 1.2 meter length is the raw material for knot and slivering machines. The knot removing machine removes both external and internal protrudes/knots from the bamboo, which is then passed through silvering machine for the fine splits of 0.6 to 1.0 mm thick.

Bamboo splitters can slice a bamboo into six, eight and twelve parts leaving straight strips having a thickness equal to wall thickness of the bamboo. In normal practice, a radially bladed circular splitter of conical shape (6, 8 & 12 blades & splitters diameter ranging from 3" - 10") is pushed down manually or by the use of a mallet over the vertically positioned bamboo section. The radial blade splitter is held

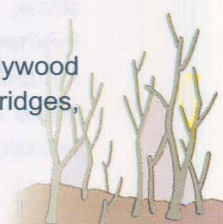
SPECIFICATIONS

Drive System	: Mechanical (Chain Drive)
Motor	: 3 HP, 3 Phase, 220 V
Bed Length	: 2.4 m
Tool Diameter	: 300 mm
Bamboo Cut-size	: 1.2 m
Processing Speed	: 200 - 240 Nos of bamboo of 1.2 m length per hour
Weight	: 400 Kg (approx.)



USERS/BENEFICIARIES

Handicraft industry, board, mat paper & plywood industry, housing, food & fodder, road & bridges, medicines and furniture



Agro & Geo-Scientific Instrumentation

Bamboo Knot Removing & Slivering Machine

In House Project

The applications of knot removed and slivered bamboo depend upon the thickness of the slivered blades for making mat, board, cloth, furniture, pre fabricated houses, jewellery, handicraft items and other house hold items .

DESCRIPTION

The machine operates in such a way that the blades can be of adjustable type to suit varying sliver sizes and the waste bamboo pieces should not get stuck in the roller. The bamboo splits are fed to the rollers by



Bamboo Knot Removing & Slivering Machine

After splitting, the nodes and other protrusions are seen on the splits. This is simply the internal projection of the node. In most cases, the knot would need to be removed for smoother surface. Improper removal of the projections on the bamboo splits weakens the strength and increases the number of rejections. The cutting edge of the tool is designed so as to able to tackle curvature on splits. This may need a double cutting edge, one curved and other straight. The angled blade reduces fatigue and working stress. It is flared at the end to create stronger grip & lesser chances of the hand slipping.

Each Bamboo split obtained from the above process would have two parallel curved surfaces along its length. These splits need to be further processed to obtain the flat surfaces before their shipment for more value addition. For converting bamboo splits into flat sliver, a semi-mechanized machine fitted with a flywheel has been developed. It will have spring-loaded rollers to drive the split against the preset blade angle. The sharp edged blades are set firmly between the feeder rollers and pull out rollers.

rotating the flywheel manually or belt driven by a 2 HP motor. The bamboo split needs to be passed two to three times for getting the required finish.

Though machinery from various sources has become operational in recent years for primary processing for bamboo, but the base requirement is for an optimal configuration of machinery with adequate performance and productivity in a cost-effective manner to process bamboo culm to slivers straight for different applications.

SPECIFICATIONS

Drive System	:	Mechanical (Pulley System)
Motors (2 Nos)	:	1.5 & 1.0 HP respectively (Single phase 220 V, 50 Hz)
Tools (3 Nos)	:	HSS and Carbide Cutters (Approx. 35 mm)
Processing Length	:	1.2 m
Processing Speed	:	240 m per hr
Weight	:	130 Kg (approx.)

USERS/BENEFICIARIES: Handicraft Industry, board, mat paper & plywood industry, housing, food & fodder, road & bridges, medicines and furniture

Agro & Geo-Scientific Instrumentation

Laser Land Leveller

Sponsored by
ICAR, New Delhi

In the area of agriculture and farming, optimum use of natural resources is an essential need of the day. It has been observed that unlevelled agricultural fields after ploughing need more water for irrigation etc. Agriculturists have been using manual techniques to level the fields, but it is a laborious and time

receives the signal from the transmitter and actuates the scraper blade to keep it at the desired elevation of the field. The tractor-scraper operation all around the field gives the necessary final elevation. The system can cover a radial distance of 150 m without sunlight.



Laser Land Leveller

consuming process and requires skill. Thus, there is a need for development of automatic land levelling system for optimum utilization of water resources and to increase productivity. The laser land leveller is one such system, which adds automation in the land levelling process during ploughing of fields.

DESCRIPTION

The system consists of sub-assemblies like Laser Emitter, Laser Receiver and Control Box (Driving & Control Electronics). The Laser Transmitter of the system mounted on the stand is placed near the field, which projects a tight beam from a revolving head. A receiver mounted on the scraper (fitted on the tractor)

SPECIFICATIONS

Accuracy	:	within 25 arc sec of the true horizontal
Operation Control	:	manual and automatic
Power	:	battery operated 6/12 VDC

UNIQUENESS/NOVELTY

- Uniform application of water
- Better regulation & saving irrigation time Soil & moisture conservation

Agro & Geo-Scientific Instrumentation

Digital Moisture Probe

Sponsored by
Ministry of Consumer Affairs, New Delhi

Monitoring of moisture content of grains, cereals, fertilizers, tea, tobacco, etc. is important for their storage and quality. Automated moisture measuring systems are thus in great demand for achieving the above purpose. A digital moisture probe has been

the tip where moisture of the grains is registered. It is simple to use, accurate, versatile with minimum controls to determine moisture content. An automatic temperature compensation mechanism has been provided to ensure optimal accuracy.



Digital Moisture Probe

designed and developed to control the moisture in grains, cereals, etc.

The probe works on the principle of variation in electrical conductivity, which increases with moistness. It has a sensing system, a microcontroller and a display unit. The sensing system consists of two special metallic sensors embedded in a probe, electrically insulated, except at a contact point near

SPECIFICATIONS

Power Supply	: ±9V DC
Measuring Range	: 6-25%
Accuracy	: ±0.3%

USERS/BENEFICIARIES

PAU, Ludhiana; HAU, Hisar; IARI, New Delhi; Grain Mandis

Automated Formaldehyde Concentration Measurement System

Sponsored by
TMOP&M, New Delhi

Argemone obtained from the seeds of argemone mexicana is reported to contain alkaloids of sanguinarine and di-hydro sanguinarine. The seeds are blackish brown and have superficial resemblance to mustard seeds. Thus, argemone oil is an adulterant in mustard oil which is undesirable for edible purposes and has been reported to be fatal if the concentration level increases beyond certain limits. Many dropsy cases have been reported due to the consumption of

mustard adulterated oils. Presently qualitative, semi quantitative and costly chromatographic methods are being used for its analysis.

DESCRIPTION

The system involves extraction of argemone from the oil mixture, conversion of alkaloids into formaldehyde and the suitable color development of formaldehyde and measurement of concentration in ppm range.

Agro & Geo-Scientific Instrumentation



Formaldehyde Concentration Measurement System

Using the absorption principle (Beer-Lambert law) studies have been carried out to determine unknown concentration of the formaldehyde by comparing it with standard calibration curve and this will further lead to determination of Argemone on its conversion to formaldehyde.

The system consists of an LED as a light source; sample holding system, detector current to voltage converter, A/D converter, log amplifier and display. The electronic card has been designed and fabricated to convert the microampere signal into millivolts using operational amplifiers. Data acquisition card (ADAM-4011) has been used as a sensor. The ADAM just uses two wires for communication over an RS-485 multi-drop network. Its analog input modules accept a wide range of input signals. The analog output (mV) of

the electronic card is changed to digital output by ADAM-4011 and is fed to the computer. Then the digital output is read by the software. The software takes the ratio of the sample with respect to blank. The computer takes the input from the ADAM-4011 to calculate the log of two ratios, which gives the absorbance directly and relates to concentration level of formaldehyde.

USERS/BENEFICIARIES

Oil industry, R&D and academic Institutes

UNIQUENESS/NOVELTY

Cost-effective, simple to use & direct concentration measurements

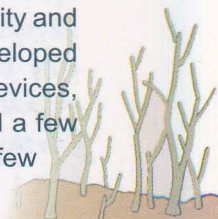
POPULARISATION OF TECHNOLOGIES DEVELOPED UNDER TMOP&M PROGRAMME

Digital Cereal/Grain Analyser

Sponsored by
TMOP&M, New Delhi

Digital Cereal/ Grain Analyser (DCGA) was developed under a project sponsored by the Technology Mission on Oilseeds, Pulses & Maize (TMOP&M), New Delhi. Upon successful completion of the project, another project entitled "Popularization of Digital Cereal/ Grain Analyser" was sponsored by

TMOP&M. Under the new project, the design of the DCGA prototype was improved for better stability and accuracy. The technology of the earlier developed was transferred to M/s Vaiseshika Electron Devices, Ambala Cantt. The firm has already produced a few pieces of the instrument CSIO has fabricated a few



Agro & Geo-Scientific Instrumentation

pieces and the same were tested, calibrated and handed over to the user industries.

A technical paper entitled "Cereal Grain Analyser" has also been published in "IETE Technical Review" in this regard. A pamphlet of the instrument has been printed

by the firm/CSIO and distributed to the interested parties. The instrument has been taken to various workshops and exhibited for popularization. It is useful for animal husbandry, oil seeds, pulses, grams and agro-industries.

Digital Aflatoxin Meter

Sponsored by
TMOP&M, New Delhi

This instrument was also developed under a project sponsored by TMOP&M. It measures aflatoxin, potent carcinogenic and tetraogenic metabolites in oilseeds & cakes. Aflatoxins are produced by certain fungi in/on foods and feeds. The instrument developed is portable, low cost & easy to handle. Technical know-how of the instrument has already been transferred to M/s Azjtronics Instrumentation, Chandigarh.

The system has been supplied to the following firms/institutions

- Deptt. of Biotechnology, Jamia Hamdard, Delhi
- Milkfed Cattle Feed Plant, Battian, Punjab
- Godrej Agrovvet, Khanna, Punjab
- Venkys, Vill. Sountli, Shahzadpur, Distt. Ambala, Haryana
- Ayur Vet. Ltd. Vikas Marg, Delhi.
- Poshak Feeds, Karnal, Haryana
- Balakrishna Hatcheries, Miraj, Sanghali, Maharashtra

- Dhara Vegetable Oil & Food, Vadodara, Gujarat.
- Maharashtra Feeds, Sonipat, Haryana
- Sri Ram Institute, Delhi
- Rakshya Mantralaya, C/o 56 APO
- P. Feeds, Chhattisgarh
- Trident, Bombay
- CMERI, Durgapur, West Bengal
- Indian Maize Development Association, New Delhi
- Deptt. of Biochemistry, Faculty of Life Sciences, AMU, Aligarh, UP
- Times Scientific Company, Ambala Cantt, Haryana
- EISCO, Ambala Cantt
- EYEOPTIKA, Ambala Cantt
- R.K. Enterprises, Chandigarh
- Kanwar Enterprises, New Delhi

Portable Kits and Instruments for Edible Oils & Detection of Pollutants:

Sponsored by
TMOP&M, New Delhi

The main objective of the project is to popularize these systems amongst the industry involved in design & development of instruments so that these systems may be developed by them for the benefit of oil industry. Under this programme, the know-how developed has been transferred to two companies,

namely:

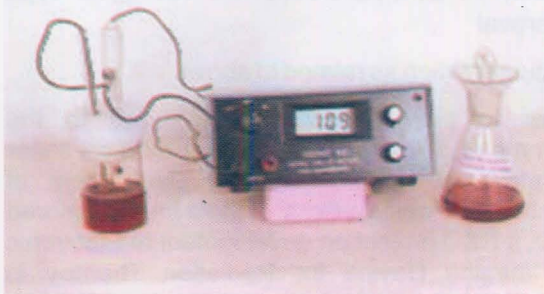
- M/s Vaiseshika Electron Devices, Ambala Cantt, Haryana
- M/s Abrol Associates, Industrial Area, Phase-II, Chandigarh,

Agro & Geo-Scientific Instrumentation

M/s Vaiseshika Electron Devices has started commercial production of iodine value meter and oil



Iodine Value Meter



Oil Spectrophotometer

spectrophotometer. The manufactured products are in use at different industries.



Digital Titrator

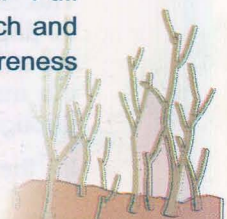
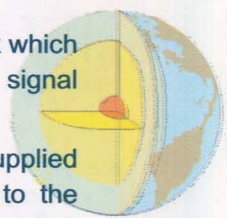
Development & Supply of Portable Analog Seismograph with Accessories

Sponsored by
IIT, Kanpur

One unit of a portable analog seismograph has been developed, tested and supplied to IIT Kanpur. A portable analog seismograph is meant to monitor, process and record the seismic signal from a remote area under observation. It processes the low frequency, low amplitude and highly noise corrupted signal generated by the short period seismograph, in response to ground motion and finally record this processed data alongwith precision timing information on a smoked paper wrapped on a drum.

The recording is tagged with the internal clock which in turn is synchronized with ATA timing signal transmitted by NPL New Delhi.

The CSIO team installed and tested the supplied system at IIT Kanpur and demonstrated it to the technical staff of the user department. Full demonstration has also been given to B. Tech and M.Tech students of IIT Kanpur to create awareness amongst them.



Medical Instrumentation & Intelligent Prosthetic Devices for Disabled

Medical instruments and prosthetic devices play a key role in delivering quality healthcare and in mitigating the sufferings of the physically challenged persons. The new evolving R&D trends in these areas include low-cost, disposable and in-vivo systems with on-line and real-time diagnostic capabilities and novel bio-compatible materials.

CSIO has been actively involved in this area for the last over two decades with several medium cost - medium volume and high cost - low volume medical instruments having been developed. Some of the developed technologies are being currently produced by the industry which has enabled better healthcare of the masses through indigenous medical instrumentation.

In the area of Medical Instrumentation, CSIO's stress has been on -

- High cost-low volume instruments
- Medium cost-medium volume instruments
- Intelligent Prosthetic Devices for disabled

As regards, high cost - low volume instruments, CSIO is actively participating in the indigenous development of 6 MeV Medical Linear Accelerator in collaboration with SAMEER, Mumbai and PMT, Bangalore. The Programme has been sponsored by the Department of Information Technology (DIT), Govt. of India, New

Delhi. X-rays of very high energy and penetrating power as produced by medical linear accelerators are the most effective method for treatment of deep seated tumours leading to improvement in the cure rate and better quality of life for the treated patients.

During the period, first indigenous 6 MeV machine was brought to near completion and was awaiting Type Approval from AERB.

CSIO's role comprised:

- Development of Computerized Controls for Gantry and Patient Sub Assembly
- Gantry Angle Display Assembly
- Fabrication & Integration of Field & Range Optics
- Installation & Commissioning
- Quality Assurance/Acceptance Testing & Type Approval
- Documentation as related to above

In order to provide technological edge to the programme of developing indigenous medical linear accelerators in the Country, the Department of Information Technology, Govt. of India has sponsored to CSIO, a R&D project on development of Electronic Portal Imaging Device for Radiation Therapy in collaboration with M/s TSG Integrations, New Delhi.



6 MeV Medical Linear Accelerator - JV1

The device, besides providing geometrical accuracy for patient alignment relative to the beam also checks the efficacy of the treatment. The images are taken by the machine that eventually delivers the treatment through the port from where the beam comes out.

In the area of medium cost - medium volume

instruments, Sodium/Potassium Analyzer which is a microprocessor based sophisticated critical care medical instrument using ion selective electrodes, was also brought to near completion. The instrument measures Sodium, Potassium and Chloride in the whole blood, serum, plasma and urine.

Medical Instrumentation & Intelligent Prosthetic Devices for Disabled

Under sponsorship from the Department of Electronics (now Department of Information Technology), Govt. of India, New Delhi, CSIO had successfully developed a Pulse Oximeter for measurement of oxygen saturation in the arterial blood. The know-how of the instrument after successful clinical trials at PGI, Chandigarh had been transferred to a Kochi based company. Since the technology of the instrument has undergone a sea change, DIT has sponsored the technological upgradation of the instrument in collaboration with SCL, SAS Nagar. The upgraded instrument with FPGA/micro-controller shall be battery operated with trend facility, better reliability and marked reduction in weight and size.

The Clinical Chemistry Analyser whose know-how had been transferred by CSIO to a Mohali based Company has been an astounding success. Almost 50 pieces of equipment developed by CSIO had been sold and is reported to be giving tough competition to similar imported equipment.

In the area of Artificial Prosthetic aids under CSIR Networked Project on "Electronics for Societal Purposes", following Artificial Prosthetic aids have been undertaken for development.

- Artificial Knee Joint in collaboration with CMERI, Durgapur
- Electronic Hand (voice operated) in collaboration

with CEERI, Pilani and CMERI, Durgapur

- Myo-Electric Arm
- Spoon Feeding Robot System in collaboration with CEERI, Pilani
- Functional Electrical Stimulation System

During 2004-05, all these aids were in advanced stage of development. Preliminary testing of Artificial Knee provided encouraging results. In order to assess the technical feasibility of the Functional Electrical Stimulation System, preliminary clinical trials undertaken on a paraplegic at Govt. Medical College - cum-Hospital, Chandigarh were highly successful.

In this area, development of Hand Held Scanner based Hindi and English Text Recording Machine for visually impaired persons taken up in collaboration with C-DAC, Noida through sponsorship provided by DIT, New Delhi is also nearing completion.

In order to have focused approach to the medical instrumentation activity during the XIth Plan, a Road Map was formulated by an expert team constituted under the Chairmanship of Dr. Lazar Mathew, Member, RC of CSIO. The Road Map identified the following R&D projects for initiation during XIth Five Year Plan :

- * Multi Leaf Collimator
- * Blood Gas Analyzer
- * Digital X-Ray Imaging System
- * Digital Holter Recorder
- * Medical Expert Systems

Development of Enzyme Electrodes for Determination of Creatinine in Biological Fluids

Sponsored by
DST, New Delhi

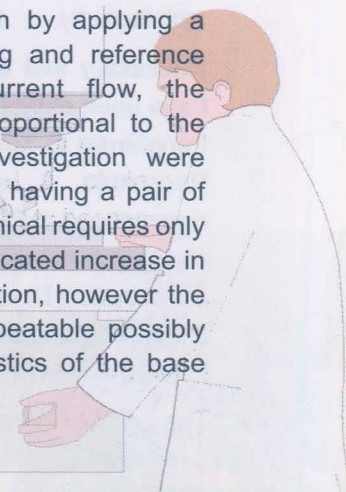
Creatinine is a useful indicator of renal function. Presently, creatinine is determined by conventional spectro-photometric techniques which consume a considerable time. Use of biosensors for rapid determination of these parameters is increasing at a very fast pace in the global scenario.

Biosensors in the form of disposable strips for determination of creatinine in clinical samples are not yet commercially available in international market and therefore their development is important

DESCRIPTION

Creatinine determination using biosensor strips is

based on amperometric approach by applying a constant voltage between working and reference electrodes which results in current flow, the magnitude of which is directly proportional to the concentration of the analyte. Investigation were carried out using bio-sensor strips having a pair of parallel conducting paths. The technical requires only 15 microlitre and the study has indicated increase in current with increase in concentration, however the results are non-linear and non-repeatable possibly due to the variation of characteristics of the base electrodes developed manually.



Cockpit Instrumentation and Opto-Mechanical Systems

Optics & Opto-mechanics form an important part of a large number of instruments used for a variety of applications. R&D in the broad area of optical & opto-mechanical systems in general and avionics in particular, has been an active pursuit of the Institute over the years and as a result, expertise has been acquired and excellent infrastructural facilities created. These include optical design, aspheric optics, precision optics fabrication & testing, optical systems fabrication, assembly & testing, and thin film deposition & characterization. In the initial phases of this activity, development of conventional optics, which include large and small optical industries components was a major thrust area and this led to establishment of a small scale optical industry in the periphery of Chandigarh and Ambala, in particular. These industries, today, are self-sustaining, vibrant and also cater to the needs of the developed countries through exports.

The current R&D activities of the Group are as follows:

HEAD UP DISPLAY FOR LIGHT COMBAT AIRCRAFT (TEJAS)

The project was funded by Aeronautical Development Establishment (ADE), Ministry of Defence, Govt of India. As per the MOU requirement, fully engineered six numbers of the prototypes were developed in the first phase and delivered out of which three are airworthy units. Three HUD units are installed in LCA-TD2, LCA-PV1 and LCA-PV2 and are working satisfactorily.

Necessary test & evaluation tools and procedures have been established and the technology has been transferred to M/s Bharat Electronics Limited (BEL) Panchkula. A batch production of 11 units has commenced at BEL, Panchkula as part of the second phase of development with funding provided by Aeronautical Development Agency (ADA), Ministry of Defence, Bangalore. These units will be used in the Limited Series Production (LSP) of LCA.

The up front control panel (UFCP) which was being

used with HUD till Serial No. 007 has been replaced with Multi Functional UFCP (MF-UFCP). With this addition, two units have been delivered which are being successfully used for ground testing of LCA PV2 (Product Version 2 of LCA).

The implementation of Night Mode feature in HUD is in final stages and the unit with serial number 013 onwards will be fabricated with both day and night mode features. The unit serial number 012 will be offered for Safety of Flight Tests (SOF) in near future. It is also proposed to deliver two Airworthy Units with Standard of Preparation (SOP) of HUD unit Serial Number 012 for LCA Ground Testing and remaining three units in future.

The main features incorporated in the system are:

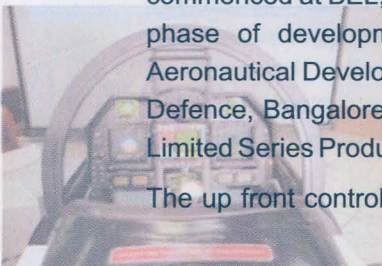
- Total field of view 25 degrees
- Brightness > 3300 foot lamberts
- Capability to use it in night with FLIR camera
- Automatic brightness control for hand free operation

HEAD UP DISPLAY FOR HINDUSTAN JET TRAINER (HJT) AND ADVANCED JET TRAINER (AJT)

Development of HUD for HJT 36 has been sponsored by HAL, Bangalore. This HUD is an improved and compact version in comparison to HUD for LCA. The overall volume would be 60% of the LCA-HUD and weight would be 15 Kg. A new feature of electronic stand by sight (SBS) has been introduced which will guide the pilot for combating and landing, in case the mission computer of the aircraft fails. The synthetic SBS symbology will be displayed whenever the pilot demands. Three airworthy units alongwith five data entry panels are to be delivered and the first prototype is likely to be completed in near future.

LENS ASSEMBLY FOR HUDWAC SYSTEM

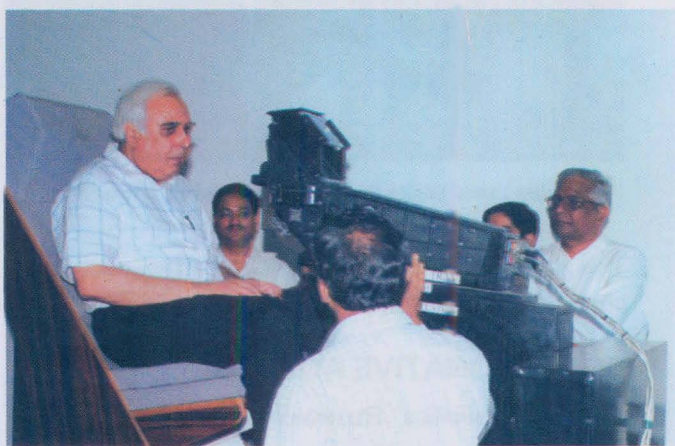
On successful completion of HUD for LCA, HAL,



Cockpit Instrumentation and Opto-Mechanical Systems

Korwa has also given an order for design, development & supply of three units of Lens Assembly for Head Up Display and Weapon Aiming Computer

(HUDWAC). The unique feature of this lens assembly is that it is also having static optical Stand By Sight (SBS) system.



Hon'ble Minister Shri Kapil Sibal Seeing Performance of HUD System



Cockpit view of LCA with CSIO HUD

Participation in the International Air Show 2005

- The HUD unit was demonstrated in the International Air Show held at Bangalore during February 7-8, 2005. The Unit was integrated with Combat Aircraft Trainer (CAT) Mockup along with other avionics and functional demonstration was

made. The stall was visited and appreciated by several important dignitaries including the Hon'ble Defence Minister Shri Pranab Mukherjee.

- The LCA TD2 and PV1 took successful flights with CSIO HUDs in formation.

This Group has developed the following technology during the year.

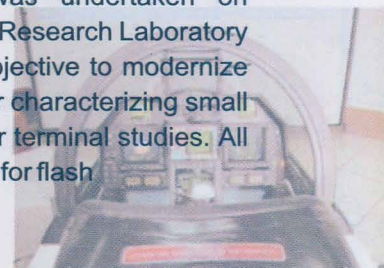
Technology developed

Multiple Laser Diode based Sources for Shadowgraphy. This is exclusively for defence application

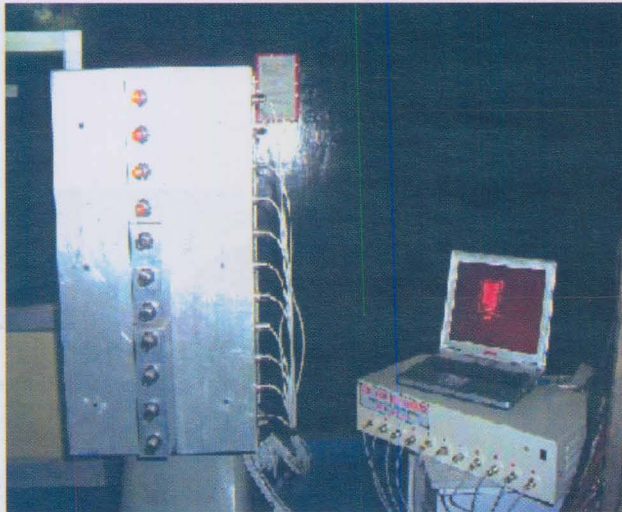
Sponsored by
Armament Research Board (ARMREB), New Delhi and
Terminal Ballistics Research Laboratory (TBRL), Chandigarh

The existing shadowgraphy system at TBRL, Chandigarh is based on spark shadow technique using arrays of spark sources for illumination, field lens and conventional silver halide films to record the event and to study the terminal characteristics of small ammunition including their effects of impact on various targets, namely, bullet proof jackets, helmets, glasses, other materials, etc.

A project entitled "Laser based Flash Shadow Photographic System for Terminal Studies of Small Arms Ammunitions (SAA)" was undertaken on request from Terminal Ballistics Research Laboratory (TBRL), Chandigarh with an objective to modernize the existing facilities of TBRL for characterizing small calibre projectiles including their terminal studies. All over the world flash sources used for flash

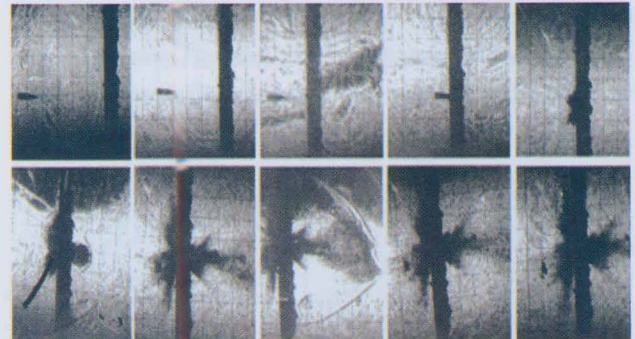


Cockpit Instrumentation and Opto-Mechanical Systems



Multiple Laser Diode Based Sources for Shadowgraphy

shadowgraphy uses high wattage arc sources which have been replaced by innovative design and development of multiple laser diode sources. In International scenario, there is no report available about the use of multiple low power compact laser diodes to record flash shadowgraphs. Laser diodes are not only highly energy efficient and compact, but also amenable to precise control of exposure and delay timings in the range of nano seconds. The successful completion of the project has result in the development of this new technology. This has been developed Specially for defence applications



Multiple Laser Diode Based Sources for Shadowgraphy

This technology has flowed out of the successful completion of the project.

COLLABORATIVE AGENCY

Terminal Ballistics Research Laboratory (TBRL), Chandigarh

NOVELTY/UNIQUENESS

Low power consumption, ease of use, first multiple shadowgraphy system, longer life time

USERS

Armament Research Board (ARMREB), New Delhi and Terminal Ballistics Research Laboratory (TBRL), Chandigarh

Consultancy on Design & Development of Identified Components of Counting Chamber

M/s Gupta Sons India, Jagadhri Road, Mahesh Nagar, Ambala cantt., a small scale industry was provided general consultancy in design and development of some components for Counting Chamber. Mr Vishal Mittal of the company took the training for a period of sixty days starting from March

2004 as per terms and conditions. Training was imparted to develop five numbers of masters and twenty pieces of replication of masters. The consultancy work was successfully completed and the same has been utilized beneficially by the company

Fiber / Laser Optics based Instrumentation

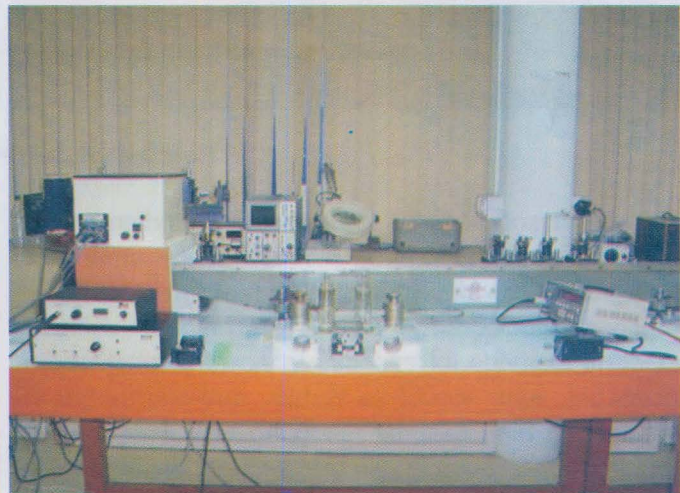
Fiber and Laser Optics based instrumentation is an important field which has made impact in various application areas : metrology, research, sensors, communication, security, safety, and defence. Recognising the growing importance and futuristic potential of this field, CSIO had initiated R&D programmes in the broad areas of fiber optic sensors, fiber optic systems and holography and a number of technologies/ techniques were developed and investigated.

Fiber Optic Sensors is an important and rapidly growing discipline for structural health monitoring and other applications. Work has been pursued in developing various fiber optic sensors for the last

more than a decade and expertise has been generated in both interferometric and non-interferometric fiber optic sensors. The fiber optic Extrinsic Fabry Perot Interferometric (EFPI) sensor, Fiber Bragg Grating (FBG) and Long Period Grating (LPG) have recently emerged as highly important sensing components. Expertise has been generated and infrastructural facilities are being created for indigenous development of EFPI sensors, FBGs and LPGs which will be highly beneficial for distributed and multiplexed sensing solutions in the areas of civil and aerospace structures, oil & gas exploration wells and monitoring of power systems. Mechanical LPGs have



Setup for Wind Impact FBG Sensor



Setup for Mechanical LPG Based Concentration & Refractive-Index Sensor

been designed, fabricated and investigated for sensing bends in structures and measurement of refractive index and concentration of liquids. Single and multiplexed FBGs have been studied for wind impact on vehicles / structures, petrol leak detection in pipes, strain and temperature measurement in structures.

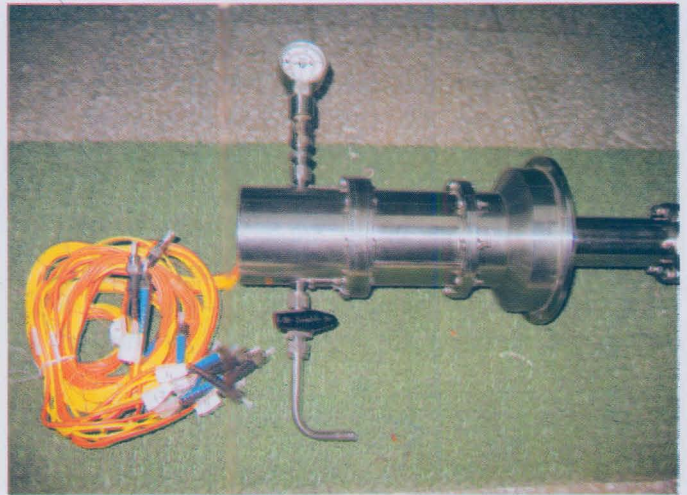
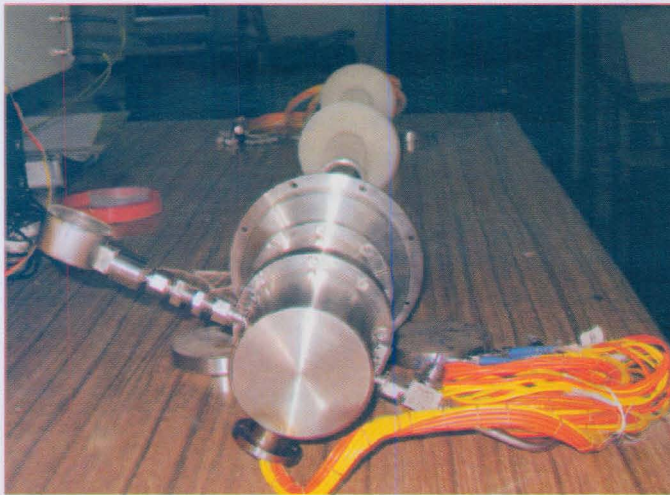
This work on the development of FBGs and LPGs and their applications in the realms of sensors for different areas and communication is being carried out under the project sponsored by NPSM, Bangalore and the CSIR's Networked project 'Development of Key Technologies for Photonics and Optoelectronics'.

Optical fiber systems are fast replacing the conventional electronics/electrical systems for various applications owing to the various technological advantages over the existing systems. Work has been carried out and expertise generated for (i) replacement of micro switches with fiber optic sensors, protection of critical assets, fiber optic linkages of on board computer with sensors and actuators, machine and ammunition guarding, and neuro-fuzzy systems to eliminate false alarms for strategic applications and agencies, (ii) development of fiber optic system for early warning and detection of land slides and its future spin offs in the realms of oil

Fiber / Laser Optics based Instrumentation

and gas exploration wells monitoring, pipeline integrity and subsea sensing and (iii) programme involving FIDS, convergence with other contemporary

technologies, fiber optic imaging probes, avionics, naval instrumentation, security and tactical solutions. Holography is playing an important role in anti-



Fiber Optic Nuclear Penetration Assembly

counterfeit and security applications. Expertise has been created and work is pursued in the area of Holography for development of (i) High security embossed hologram mastering techniques using different methods for encoding concealed machine-readable and visual-verifiable anti-counterfeit features in high security hologram and their wide ranging applications in different security documents related areas, (ii) Holographic optical elements based interferometers and their suitability for performing

optical test studies on phase objects in real-time, (iii) establishment of embossing masters generation facility for production of 2D/3D, 3D, stereogram and dot matrix/ high security embossed holograms for strategic and security applications with an aim of meeting the requirements of high end financial, revenue and security related user agencies and (iv) Holographic optical elements technology for avionics based systems.



Analytical Instruments & MEMS

Analytical instruments have been playing a key role for characterization and quality assessment of various products manufactured by the industry. Both on-line and off-line kind of instruments are the need of the industry to maintain and improve the quality of their products. The technology of micro electro mechanical systems (MEMS) is a rapidly emerging area finding important applications in sensors, healthcare, industry space, defence and communication and this field has witnessed a phenomenal growth in the recent past over the globe. The miniaturization in the technology development is the need of the day. This Group has been actively engaged in this area for quite some time.

The R&D activities being pursued by this Group fall under two distinct areas namely (i) Analytical, environmental monitoring instrumentation and (ii) Microelectronics instrumentation and MEMS. The objective of this programme is to develop expertise and technologies in the above area through several R&D programmes, partnerships and collaborations with industry, government and the academia.

The major effort of the programme is to develop generic instruments for the analysis of solid, liquid, gas and plasma. Besides these instruments, a large number of equipments for sectoral applications such as water, air quality monitoring, and food processing and oil industry have also been developed. Surface topography techniques have also been developed for analysis based on microscopy. The Group has developed instruments in the areas of atomic and

molecular spectroscopy in UV-Vis-IR & X ray spectroscopy. As a result several technologies including Glow Discharge Lamp, Atomic Emission Spectrometer & Atomic Absorption Spectrophotometer have been transferred to the industry. Additionally the know how the Gold Analyser was assigned to NRDC, New Delhi.

The Group has established itself in the area of instrumentation for microelectronics and developed instruments such as Molecular Beam Epitaxy System, Reactive Ion Etching System, Reactive Ion Beam Controlled, Etching System, RF/DC Sputtering System, Electron Beam Deposition System and VLSI Testing System. This led to initiation of R&D activity in instrumentation required for development of MEMS devices. NPSM/ADA sponsored a project entitled "Development of Plasma Etching Processes for High Aspect Ratio Structures for MEMS Applications". The Group has established linkages with some of the R&D institutes in Germany and has created state-of-the-art infrastructure with expertise in the area where future technological breakthroughs are likely to happen.

This Group is actively working in the area of III-V compound semi-conducting materials for optoelectronic and microwave devices/applications. Non-linear photorefractive materials using AlGaAs/GaAs are being deposited using Molecular Beam Epitaxy System for the development of laser diodes, photodetectors, metal oxide and porous silicon based gas sensors for the detection of volatile toxic gases and foul odour.

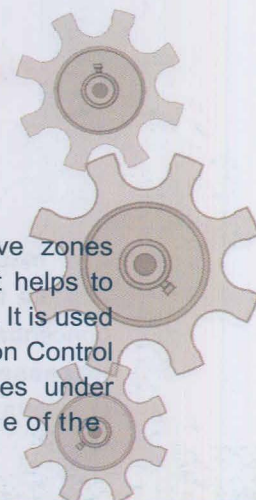
Technologies developed and ready for know-how transfer are:

Real Time Sound Analyzer

Sponsored by
DST, New Delhi

This instrument is highly useful in real time sound analysis to monitor noise pollution in the ambient air and further to adopt suitable control strategies. The developed sound analyser is data logger based to compute the various noise parameters and thus measures the noise pollution in residential,

commercial, industrial and noise sensitive zones apart from vehicular noise pollution. So it helps to decide the threshold limit of noise pollution. It is used by the Department of Environment, Pollution Control Board, Industries, and Academic Institutes under clean and green technology programme of the



Analytical Instruments & MEMS



Real Time Sound Analyzer

Government of India including Occupational Safety Health Administration (OSHA).

DESCRIPTION

Electrate condenser microphone converts sound energy into electrical with reference to 20μ Pascal sound pressure and computes the noise pollution level in dB scale and displays it with real time clock. It has the memory system of 512 Kbyte RAM with frequency and duration display capacity. Apart from noise pollution measurement in sensitive, residential, commercial and industrial zones, it can also compute the dose of noise, types of noise pollution and its threshold level.

UNIQUENESS/NOVELTY

This is a lap top based system using indigenous components with a low cost and with battery back up features.

USERS/BENEFICIARIES

- Pollution Control Boards
- Industries like thermal power plants, chemical industries, cement plants, mechanical workshop, academic institutes, universities & community health group, A.C. plant manufacturers, Environment Society of India, Envirotech etc.

Microcontroller based Coefficient of Haze and Dust Mass Monitor

Sponsored by
Ministry of Environment & Forests, New Delhi

The results of numerous epidemiological studies indicate that an increase in Particulate Matter (PM) concentration is associated with increased mortality, increased hospitalization for respiratory or cardiovascular diseases and decreased lung

function. According to the available data in the literature, 10 g/m^3 increase in PM_{10} concentration is found to be associated with 1% increase in daily mortality. Accurate monitoring of inhalable dust, therefore, finds major application in Community

Analytical Instruments & MEMS



Coefficient of Haze and Dust Mass Monitor

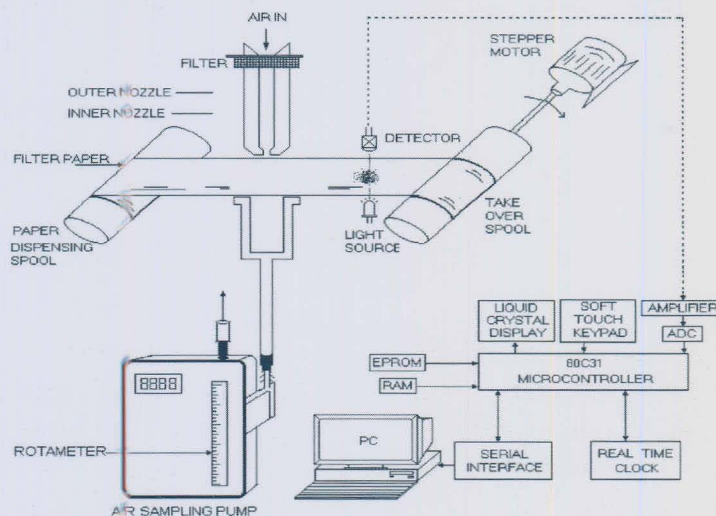
Health Studies.

Measurement of coefficient of haze (CoH) is one of the five main components of index of the quality of air (IQUA) which is an industry standard to compare various samples of air. This instrument determines the instantaneous and average level of black dust mass concentration along with coefficient of haze (CoH) at ground level.

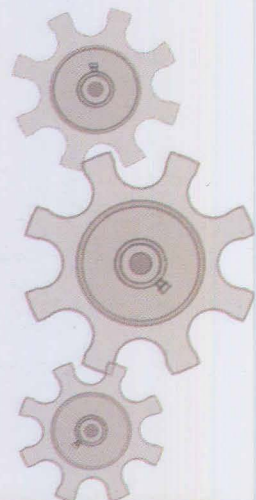
DESCRIPTION

In this instrument, a pump draws air at a predetermined constant flow rate through a sampling

head. The dust particles are allowed to deposit on a filter for a fixed time. A dust spot is, therefore, formed on the filter paper proportional to the dust load in the ambient air. Before the sampling of dust, the microcontroller (8051) reads the intensity of transmitted light through blank filter paper (I_0) and latches this data in the memory. At the end of sampling time, the spot on the tape is moved in front of photo detector very precisely with the help of a stepper motor. The motion of the stepper motor is controlled by a microcontroller. The light detector senses the light intensity passing through the spot (I). The value



Block Diagram of COH & Dust Mass Monitor



Analytical Instruments & MEMS

of CoH can now be calculated from

$$\text{CoH} = K \log (I_0/I)$$

where K is a constant depending on area of spot.

To convert CoH to mass value, it is fed to a function converter chip. The system displays the mean value of CoH and dust mass concentration on an LCD display. Other parameters and facilities that are of interest to the user viz. peak value, serial link with PC for data logging, date, time and place of sampling, alarms etc. have been provided via a Hex Key pad on the instrument panel.

UNIQUENESS/NOVELTY

The values of photo detector output I_0 and I are measured after manual adjustment of dust spot under the light source. This feature results in better positioning accuracy of the spot as compared to the conventional available monitors.

The determination of logarithm and other mathematical function for conversion from CoH to mass concentration is based on microcontroller based calculations and is not analog circuit based.

This eliminates any possible drift in the result with environmental conditions.

SPECIFICATIONS

Range of particulate mass	: 0-1.0 mg/m ³
Range of CoH	: 0-10
Sensitivity	: 1 g/m ³
Flow rate of dust loaded air	: up to 2 x 10 ⁻³ m ³ /sec
Sampling interval	: 0-99 sec.
Display	: 16 X 2 lines LCD
Temp. range	: 0-50 °C
Monitoring	: continuous/intermittent

USERS/BENEFICIARIES

- Environmental labs
- Pollution Control Boards
- Academic and R&D organizations
- Industries and Thermal Power plants

Advanced Materials based Transducers

In the present scenario new materials with novel characteristics have become significantly important and vigorous efforts are being made worldwide for their development. These materials include bio and nano materials, polymers, ceramics, photonics bandgap materials etc. which make it possible to achieve yet unknown and esoteric properties & behavior, leading to the development of systems/devices based on altogether new concepts. These developments are expected to improve our lives significantly by revolutionising the areas of medicine, food, garments, buildings/structures, war scenario, transports etc. Keeping in view this emerging scenario and the expertise available at CSIO, it was felt appropriate to give thrust to this upcoming activity and a new group in the area of Advanced Materials based Transducers was created in the Institute.

Investigative studies have been carried out to measure I-V Characteristics of functional bio-molecules, design of micro cantilevers / structures for Bio-MEMS based diagnostic kits, characterisation of carbon nano tubes (CNTs) for development of Bio-nano sensors, Actin-Myosin biomolecular motors, development of new ceramics with negative thermal coefficient of resistance, platinum and palladium based nano particles (size < 10 nm), cadmium sulphide based sensors for bio-applications and conducting polymers (pyrrol, aniline and thiophenol) based smell sensors. The future work programme in this area includes development of simple low cost diagnostic kits, implantable nano-devices, nano-switching devices, conducting polymers, metal and semi-conductors based nano particles which shall find applications in the realms of healthcare, electronics, defence and space.

The main areas of activities have been :

- Study of Electrical and Mechanical Properties of DNA for Nano Device Applications
- Immobilisation of DNA Molecules of different Sequences and Orientation between Micro & Nano Electrodes and their I-V Characteristics
- Experiments on Manipulations (Stretching and Bending) and Counting the number of bound DNA Molecules between Electrodes
- In-vitro motility of Actin-Myosin bio-molecular motors

- Dispersion & nano manipulation of CNTs
- Study of Electrical Properties of Antibody-Antigen Immune Complex for Diagnostic Applications
- Development of Fire Sensor for LCA.
- Development of Hot Air Leak Detection System for Environment Control System of LCA based on Eutectic Salt & Impedance Change
- Development of Sensors based on Conducting Polymers
- Design & Development of Off Flavour Detection System for Edible Oils
- Development of Nano Structured Inorganic Materials for Electronic, Magnetic and Optical Applications
- Synthesis and Characterisation of Nano-particles using Reverse Micellation

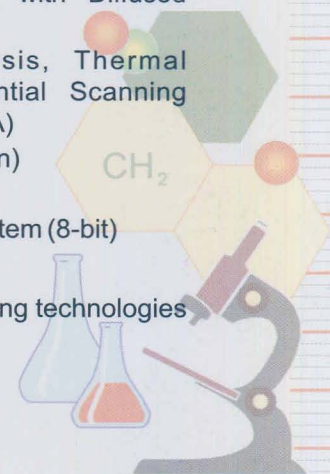
The work for development of fire sensor for LCA is in the advance stage, The sensor has been developed and its evaluation for flight clearance of LCA is in progress.

This Group is also engaged in the CSIR Networked Project entitled "Custom Tailored Special Materials (Nano Material)".

The following infrastructure for material characterisation has been established :

- Chemical Lab for Testing and Synthesis
- Analytical Instrumentation Lab for Testing and Analysis
- Metallography Lab & Mechanical Testing for Metals and Alloys
- Heat Treatment & Thermo-Mechanical Processing
- Fluorescence & Phosphorescence Spectrophotometer (Varian, USA)
- UV Visible Spectrophotometer with Diffused Reflectance (Perkin Elmer)
- Differential Thermal Analysis, Thermal Gravimetric Analysis, Differential Scanning Calorimetry System (Waters, USA)
- Langmuir Blotgett Systems (Indian)
- LCR Meter (Agilent)
- Microcontroller Development System (8-bit)
- Digital Meter (Fluke)

The Group has developed the following technologies during the year :



Infrastructural Facilities Created

- **Fiber Grating Laboratory**
- **Fluorescence Spectrophotometer**
- **Optical Tweezer cum Microdissection System**
- **Scanning Probe Microscope based Nanomanipulator**





New Facilities Created

Fiber Grating Laboratory

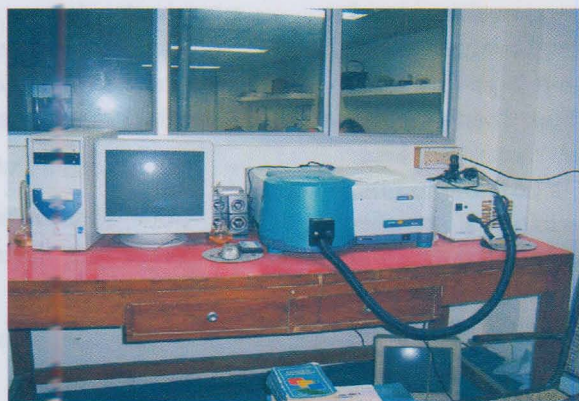


Hon'ble Minister Shri Kapil Sibal Inaugurating the Lab.

Fiber Bragg gratings (FBGs) and long period gratings (LPGs) are the two rapidly emerging novel optical fiber components finding important applications in the areas of communication for dense wavelength division multiplexing (DWDM), dispersion compensation and in sensors for structural health monitoring of aerospace and civil structures. Consequently, there has been a phenomenal growth

for development of production technology of FBGs / LPGs and implementation of their applications. CSIO has been actively engaged in this area and a Fiber Grating Laboratory has been established at CSIO, Chandigarh. The Laboratory was inaugurated by Shri Kapil Sibal, Hon'ble Minister of State for Science & Technology and Ocean Development and Vice-President, CSIR on 30th August 2004.

Fluorescence Spectrophotometer



Fluorescence Spectrophotometer

The instrument is used for the determination of metal ions as fluorescent organic complexes. Important applications

are determination of quinine, vitamins, etc. and elements like Al, Ca, Zn, etc. which are present in water & soils.

New Facilities Created

Make	: Varian Australia Pty Ltd, Australia	Measurement Capabilities : Fluorescence, Phosphorescence & Chemiluminescent behaviour of nano materials, conducting polymers and biomaterials
Model	: Cary Eclipse Fluorescence Spectrophotometer	
Measurement Technique	: Excitation, emission & Chemical Kinetics	

Optical Tweezer cum Microdissection System



Optical Tweezer

Optical tweezer cum dissector is an instrument that is capable of producing optical trap and cutting as well as catapulting of the sample. Optical tweezers work because transparent particles with a higher index of refraction than their surrounding medium are attracted towards the region of maximum laser intensity. With optical tweezers it is possible to grab and move dielectric objects and biological samples ranging in size from tens of nanometres right up to tens of microns. A microsphere, chemically coupled to a molecule of interest, provides a means of measuring the molecule's position and the force that it exerts. With dissecting action we can cut thin films, biological samples and membranes with precision of 0.3 μm as per our requirement and catapult it into the sample tube without introducing any contamination into the

sample. This facility has wide ranging applications in nanotechnology, clinical research, study of mechanical properties of biomolecules such as DNA, proteins, etc. and study of interaction of biomolecules. It has the following facilities:

- Cutting of chromosomes, DNA etc.
- Cutting and isolation of micron size tissue section, single cell, nucleus, mitochondria and other cell organelles
- Study of biomechanical properties of biomolecules
- Fluorescence microscopy
- Differential Interference Contrast (DIC) facility
- Bright and dark field microscopy

New Facilities Created

Scanning Probe Microscope based Nanomanipulator



Scanning Probe Microscope based Nanomanipulator

Scanning Probe Microscope (SPM) is a combination of various modes of Atomic Force Microscopy (AFM) and Scanning Tunneling Microscopy (STM). In these techniques the surface of a sample is scanned by a sharp tip attached to a cantilever. The tip is usually composed of a hard material such as silicon or silicon nitride and is pyramidal in shape with a sharp point having a radius of curvature from 5-80 nm. The equipment has facility for different modes of AFM such as contact, non-contact and tapping both in the air and liquid. The Veeco Explorer Model is attached with 3rd Tech nanomanipulator for handling nano-particles & single molecules. Presently, the system is used for manipulation of carbon nanotubes, DNA and biomolecular motors for study of their mechanical and electrical properties. The system has following

facilities:

- Contact and Non-contact Atomic Force Microscopy (AFM)
- Lateral Force Microscopy
- Tapping Mode (air and fluid)
- Magnetic Force Microscopy (MFM)
- Surface Potential and Phase Imaging
- Scanning Tunneling Microscopy (STM)
- Scanning Electrical Potential Microscopy (SEPM)
- Integrated Fluorescence Microscopy. Having atomic Resolution

Manipulation Capabilities for Tilt, Drag, Lift, Cut etc. at Nano and Molecular Level.

*On-going
R&D Projects at CSIO*

- **Externally Funded Projects**
- **Networked Projects**



Externally Funded

Agro & Geo-Seismic Instrumentation

S. No.	Title of the Project	Funding Agency	Project Leader
1.	Precision Portable Instrument for Measurement of Aflatoxin	TMOP&M, New Delhi	AK Ganju
2.	Development of Off-flavor Detection System for Edible Oils (Phase-II)	TMOP&M, New Delhi	ML Singla
3.	Development of Microprocessor based Portable Spectrophotometer to determine Nutrient in Soil, Water and Plants	ICAR, New Delhi	ML Singla
4.	Design and Development of Chlorophyll Measurement System	DST, New Delhi	SS Randhawa
5.	Development of an Automated Liquid Media Dispensing System	DIT, New Delhi	BS Bansod
6.	Study of Seismicity in and around Chandigarh by Establishing a Network of Three BB Seismographs	DST, New Delhi	BK Sharma
7.	Development & Fabrication of Infra Red Technique based Snow Surface Temperature Sensing Probe (11 Nos) with Accessories	SASE, Chandigarh	BK Sharma
8.	Design, Development & Supply of Snow Moisture Sensors alongwith Associated Electronics to Measure Snow Density & Liquid Water Content in Snow Pack	SASE, Chandigarh	SK Mittal
9.	Design, Development & Supply of Multi-Parameter Probes alongwith Associated Electronics to Measure Temperature & Pressure in Snow Microstructure (including Development & Supply of Infra-Red based Snow Surface Temperature Sensors)	SASE, Chandigarh	SK Mittal
10.	Design & Development of Oscillation Monitoring System for Railway Vehicles	RDSO, Lucknow	SK Mittal
11.	Development of Portable Instrument for the Determination of Gossypol in Cottonseed Deoiled Cake	TMOP&M, New Delhi	ML Singla
12.	Upgradation of Existing Network to Study the Seismicity in and around Chandigarh	DST, New Delhi	B K Sharma

Medical Instrumentation & Intelligent Prosthetic Devices for Disabled

S. No.	Title of the Project	Funding Agency	Project Leader
13.	Development of Higher Energy (15 MeV) Medical Linac	DIT, New Delhi	SR Taneja
14.	National Programme for the Deployment of Indigenously Developed Integrated Medical Linac System for Cancer Therapy (Phase-I)	DIT, New Delhi	SR Taneja
15.	Development of Adaptive Neuro Fuzzy Controller for Anaesthesia	DST, New Delhi	Amod Kumar

Externally Funded

S. No.	Title of the Project	Funding Agency	Project Leader
16.	Design & Development of Hand Held Scanner based Hindi & English Text Reading Machine for Visually Impaired Persons	DIT, New Delhi	HK Sardana
17.	Development of Annotated Speech Corpora for Three Indian Languages (Hindi, Marathi & Punjabi)	DIT, New Delhi	NK Sharma
18.	Design & Development of Vascular Microendoscope of Various Diameters	DST, New Delhi	CR Prasad
19.	Design & Development of Surgical Microscope for Cataract Surgery	DST, New Delhi	PK Goel
20.	Design & Development of Sodium/Potassium Analyzer	DST, New Delhi	SS Ahluwalia

Cockpit Instrumentation and Opto-Mechanical Systems

S. No.	Title of the Project	Funding Agency	Project Leader
21.	Design, Development & Supply of Head-Up Display for LCA	ADA, Bangalore	PK Jain
22.	Design, Development and Supply of Improved Collimating Optics for Head-Up Display for LCA	ADA, Bangalore	PP Bajpai
23.	Design & Development of Relay Lens System 1.5X (Modified Version)	ADE, Bangalore	PP Bajpai
24.	Development of Lens Assembly for HUDWAC System	HAL, Korwa	PK Jain
25.	Design, Development & Supply of Head Up Display System for AJT/HJT 36 Programme	HAL, ARDC, Bangalore	MSN Srinivas
26.	Design & Development of Low Vision Aids (Plastic Aspheric Lenses)	MoSJ&E, New Delhi	SV Rama Gopal
27.	Design & Development of Optical Grade New Material Lenses (12 D & 26 D) for Visually Impaired using state-of-art Aspheric Technology	MoSJ&E, New Delhi	GS Singh
28.	Design and Development of Tele-Microscopes (using Plastic Aspheric Doublets) as Low Vision Aids	MoSJ&E, New Delhi	SV Rama Gopal
29.	Establishment of National Facility for R&D in Aspheric based Optical & Electro- Optical Systems	DST, New Delhi	PK Jain
30.	Design and Development of Precision Aspheric Lenses for Indirect Ophthalmoscope	DST, New Delhi	GS Singh
31.	Design & Development of Hand Held Illuminated Plastic Aspheric Low Vision Reading Aids	MoSJ&E, New Delhi	SV Rama Gopal

Externally Funded

S. No.	Title of the Project	Funding Agency	Project Leader
32.	Design and Development of Night Driving Filter (Phase II)	DST, New Delhi	PK Rao
33.	Design & Development of PC based Optical Inspection System for PCBs Mounted with SMDs and Conventional Components	DST, New Delhi	R Bhatnagar
34.	Development of Prototypes of High-Precision Optical Components for High Power CO ₂ Lasers	a) Board of Research in Nuclear Sciences (BRNS), Deptt. Of Atomic Energy (DAE), Mumbai b) CAT, Indore	SV Rama Gopal
35.	Feasibility Study for Development of Super Precision Ball-End-Shaft and Cups	BARC, Mumbai	SV Rama Gopal

Fiber / Laser Optics based Instrumentation

S. No.	Title of the Project	Funding Agency	Project Leader
36.	Development of Rugged Extrinsic Fabry Perot Interferometric Sensor for Health Monitoring Studies of Aerospace & Civil Structures	ADA, Bangalore	NS Mehla
37.	Design and Development of Fiber Optics based Fire Detection & Warning System for Aircraft	AR&DB, New Delhi	JK Chhabra
38.	Fiber Bragg Gratings (FBGs) and Long Period Gratings (LPGs) for Health Monitoring of Aerospace and Civil Structures	NPSM, ADA, Bangalore	NS Mehla
39.	Design, Development, Fabrication, Testing & Delivery of Two Numbers of Leak Tight Penetration Assemblies for Fiber Optic Cables	IGCAR, Kalpakkam	JK Chhabra
40.	Design, Development & Supply of Fiber Delivery System for High Power Laser	TBRL, Chandigarh	Subhash C Jain
41.	Development of Fly-by-Light Tail Rotor Control System for Advanced Light Helicopter (ALH)	HAL, Bangalore	JK Chhabra
42.	Development and Investigation of High Security Embossed Holograms Mastering Techniques	DST, New Delhi	SK Kaura
43.	Development of Database on Scientific Instruments & Components Manufactured in India	DST, New Delhi	HS Gupta

Analytical Instruments & MEMS

S. No.	Title of the Project	Funding Agency	Project Leader
44.	Development of Plasma Etching Processes for High Aspect Ratio Structures for MEMS Applications	NPSM, ADA, Bangalore	AK Paul
45.	Development of Portable Metal Oxide Sensors for the Detection of Foul Odour	DST, New Delhi	C Ghanshyam

Externally Funded

S. No.	Title of the Project	Funding Agency	Project Leader
46.	Growth & Processing of Laser Diodes based on AlGaAs/ GaAs Quantum Well Structures using Molecular Beam Epitaxy System in the Operating Wavelength of 0.7 μm to 0.9 μm for Optical Data Recording, Laser Sensors, etc	DST, New Delhi	Nathai Ram
47.	Development of IMPATT Diode based on GaAs with Output Pulse Power of 10 W at 94 GHz (Feasibility Study & Design)	RCI, DRDO, Hyderabad	Nathai Ram
48.	Development of Detector (Sensor) based on InGaAs/InP of Wavelength Range $\lambda = 1.1$ to 1.6 μm	TBRL, Chandigarh	VP Giridhar
49.	Development of Molecular Beam Epitaxy (MBE) System (Jointly by CAT & CSIO)	CAT, Indore	Nathai Ram
50.	Development of Explosive Detector based on Ion Mobility Spectrometry (IMS) Technology	Principal Scientific Adviser to the Govt. of India through DST, New Delhi	AK Dimri
51.	Micro Controller based Ozone Monitor	Ministry of Env. & Forests, New Delhi	Basudeo Prasad
52.	Fabrication of Porous Silicon Light Emitting Diodes (LEDs) using Conducting Polymers	DST, New Delhi	Sunita Mishra
53.	Design & Development of Particle Size Analyzer for Textile Industry	DST, New Delhi	SG Sharma
54.	Development & Supply of Scanning Force Microscope	IIT, Kharagpur	AD Kaul
55.	Development of RF Bug Detector	DIT, New Delhi	NK Sharma
56.	Development of Technique & Software for the Signature Identification	GEQD, DFS MHA, Hyderabad	HK Sardana
57.	Design & Development of Automatic Counterfeit Currency Detector	DIT, New Delhi	HK Sardana
58.	Design & Development of Multizone Optical Fiber based Perturbation Sensing System	DST, New Delhi	HK Sardana

Advanced Materials based Transducers

S. No.	Title of the Project	Funding Agency	Project Leader
59.	Genome Studies Peripherals. Development of Microarray Spotter	DBT, New Delhi	Lalit M Bharadwaj
60.	Development of Microgravimetric Diagnostic Kit for Hepatitis-B	DST, New Delhi	Lalit M Bharadwaj
61.	Study of Molecular Motors for Targeted Drug Delivery and Nanomolecular Switching	DST, New Delhi	Lalit M Bharadwaj
62.	Development of Bio-MEMS based Microclinical Diagnostic Kit for Tuberculosis	NPSM, ADA, Bangalore	Lalit M Bharadwaj

Externally Funded

S. No.	Title of the Project	Funding Agency	Project Leader
63.	Microelectrophoretic Procedures for Separation and Analysis of Biomolecules	M/s Imperial Bio-Medic (P) Ltd., Chandigarh	Lalit M Bharadwaj
64.	Feasibility Study for the Development of Biosensor with Associated Instrumentation for Bacterial Pathogen Detection in Water and Food Samples	DST, New Delhi	TR Natrajan
65.	Design and Fabrication of 8x8 Array of Micro-machined Patch Antenna and Development of Fabrication Technology Compatible with MEMS Foundry at SCL	NPSM, ADA, Bangalore	VK Jain
66.	Development of Fire Safety Sensor for LCA (Phase IA & Phase II)	ADA, Bangalore	ML Singla
67.	Development of Hot Air Leak Detection System for Environmental Control System (ECS) of LCA	ADA, Bangalore	VR Harchekar
68.	Development of Fake Stamp Papers Detector	In-house Project	HK Sardana

Energy Monitoring & Conservation

S. No.	Title of the Project	Funding Agency	Project Leader
69.	Design & Development of Low Cost Power Quality Analyzer for Industrial and Commercial Applications	DIT, New Delhi	RK Mohan Rao
70.	Design and Development of Pump Efficiency Monitoring System using the State-of-Art Instrumentation and Information Technologies	DIT, New Delhi	RK Mohan Rao
71.	Design , Supply, Installation, Commissioning and Proving the Energy Saving Capability of Energy Management System at M/s Sun Paper Mill Ltd., Tirunelveli	(a) GTZ-IGEEP, New Delhi (b) Sun Paper Mill Ltd (SPM), Chennai	RK Mohan Rao

NETWORKED PROJECTS

NETWORKED PROJECT (WITH CSIO AS NODAL LABORATORY)

Title of the Networked Programme : **Electronics for Societal Purposes**

Nodal Officer & Convener of the Task Force : SR Taneja

Component of the Project/Lab Coordinator	Task/Sub-Task	Lab Project Leader
1. Electro-Optical System for Sorting, Grading, Packaging & Storage of Agricultural Products - ML Singla	1.1 Electro-optical System for Sorting, Grading and Packaging of Different Fruits, Vegetables and Grains like Rice	
	(a) Electro-optical System for Sorting, Grading and Packaging of Different Fruits and Vegetables	PK Goel
	(b) Off-line System for Classification/ Grading of Rice	HK Sardana
	1.2 Monitoring & Control System for Food Storage Houses and Optimisation of Process Parameters	Mewa Singh
	1.3 Advanced Off-line & On-line Measurement Systems for Quality Assessment of Agri-Produce	SK Angra
2. Prosthetic Instrumentation and Medical Instruments Calibration - PS Malhotra	2.1.A Intelligent Prosthetic Devices for Rehabilitation of Physically Challenged	
	(i) Artificial Knee	KS Rattan
	(ii) Functional Electrical Stimulation System	VK Sharma
	(iii) Myoelectric Arm	RS Kathuria
	(iv) Electronic Hand (Voice Operated)	Dial Singh
	(v) Spoon Feeding Robot System	NC Hira
2.1.B Speech Synthesis System	HK Sardana	
	2.2 National Facility for Medical Instruments Calibration	HK Pir
3. Instrumentation for Natural Hazards Monitoring & Early Warning Systems - MA Shamshi	3.3 Seismic Alert System to Avert Colossal Losses during the Occurrence of Major Earthquakes	Satish Kumar
	3.4 Design, Development and Installation of Instrumentation for Detection and Early Warning of Landslides	
	(a) Development of Instrumentation comprising Standard Sensors and Advanced Associated Electronics for Monitoring, Detection and Early Warning of Landslides	SK Mittal
	(b) Development of Optical Fiber Sensing System for Early Warning & Detection of Landslides	JK Chhabra
	3.5 Setting Up of Test & Calibration Centres for Seismic Instruments and Networks	BK Sharma

NETWORKED PROJECTS

NETWORKED PROJECTS (WITH CSIO AS PARTICIPATING LABORATORY)

Title of the Networked Programme/Nodal Lab.	Project Title & Lab Coordinator/ CSIO Representative in Task Force	Task/Sub-Tas	Project Leader
1. Development of Key Technologies for Photonics & Opto-Electronics - CGCRI, Kolkata	Establishment of Fabrication Technology of Fiber Bragg Gratings (FBGs) and Long Period Gratings (LPGs) for Communication & Sensor Applications NS Mehla	-	NS Mehla
2. Custom Tailored Special Materials - CGCRI, Kolkata	Nanoparticles, DNA based Nanotechnology and Group III-V Semiconductor based Quantum Well Devices ML Singla	Organic / Inorganic Non-Linear Optical Materials & Molecular Modelling	
		- Development of Non-linear Photo-Refractive Semiconductor Materials based on AlGaAs/GaAs with MBE System & their Characterization for Optical Devices Molecular Electronics	Nathai Ram
		- Study of Electrical and Mechanical Properties of DNA for Nanodevice Applications Development of Nano-structured Inorganic Materials for Novel Electronic, Magnetic & Optical Applications	Lalit M Bharadwaj
		- Synthesis & Characterization of Nanoparticles (Metals and Metal Sulphides) using Reverse Micellation	ML Singla
3. Developing Capabilities in Advanced Manufacturing Technology - CMERI, Durgapur	Development of Ultrasonic Sensors, Laser Range Sensors and Vision Systems for Autonomous Mobile Robots and Technical Support for the Development of Near Net Shape (NNS) Manufacturing Technology for Composites/Ferrous/Non-Ferrous Alloys/Metallic Glass HS Gupta	Autonomous Mobile Robot	Amod Kumar
		Squeeze Casting Metallic Glass Ribbon	Amod Kumar HK Sardana
		Metal Injection Moulding	KD Chattopadhyay
4. Upgradation of SI Base Units, National Standards of Measurements & Apex Calibration Facilities and Creation of High Quality Network of Testing & Calibration Laboratories and Preparation & Dissemination of Certified Reference Materials NPL, New Delhi	Dimensional Metrology and Reference Standards for Calibration VPS Kalsi	-	VPS Kalsi



Entrance to the school building.

Major Events

- **National Technology Day**
- **Visit of Sh Kapil Sibal, Hon'ble Union Minister of State for Science & Technology, Ocean Development and Vice President, CSIR**
- **29th Meeting of Research Council**
- **Signing of MoUs**
- **CSIR Foundation Day & Hindi Fortnight**
- **Dr Pawan Kapur takes over as Director, CSIO**
- **CSIO Foundation Day**
- **Vigilance Awareness Week**
- **CPYLS**
- **CSIO-Industry Meet at Jaipur**
- **National Science Day**



NATIONAL TECHNOLOGY DAY



CSIO Scientist Explaining Institute's Activities to Students

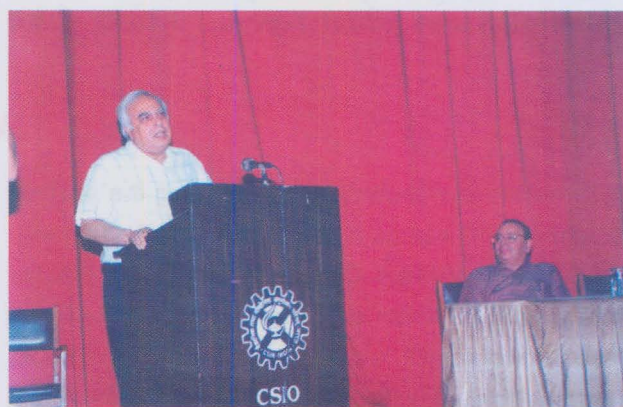
Open Day was held on the occasion of National Technology Day on May 11, 2004. All the labs of CSIO were kept open for general public. A large number of visitors including students from various schools, colleges, university and general public went

around various laboratories of the organisation. They directly interacted with the scientists and were given exposure to the technologies developed at CSIO. Shri S. R. Taneja, Scientist 'G', CSIO delivered a talk on "Technology, Marketing & Leadership" on the occasion.

VISIT OF SHRI KAPIL SIBAL, HON'BLE UNION MINISTER OF STATE FOR SCIENCE & TECHNOLOGY AND OCEAN DEVELOPMENT, AND VICE-PRESIDENT CSIR

Shri Kapil Sibal, Union Minister of State for Science & Technology and Ocean Development and Vice-President, CSIR visited CSIO on 30th August, 2004. While addressing the CSIO staff he said that technology is so deeply entwined into our lives that we tend to ignore its importance. He exhorted the scientists to make science & technology common man oriented. He stressed upon the need of public-private partnership without which we shall reach nowhere in the arena of science & technology. Shri Sibal also emphasized upon the propagation of scientific temper and inculcating the element of curiosity in students.

While going around various labs of CSIO, he was highly impressed by the research work being done by



Hon'ble Minister Addressing the Audience

the scientists of the organisation. He assured the scientists that increasing the annual expenditure on S&T from 0.7 % of GDP to about 2.0 % of GDP would

be one of his top priorities. Later, talking to the media representatives at CSIO, he agreed to the suggestion of integration of R&D institutes with universities for the advancement of technology at a greater pace.

Earlier, Dr RP Bajpai, the then Director, CSIO, while welcoming the Hon'ble Minister, highlighted the new initiatives being undertaken by CSIO in the field of nano-technology and medical electronics.

29th MEETING OF THE RESEARCH COUNCIL OF CSIO

The 29th meeting of the Research Council (RC) of CSIO was held on August 3, 2004 at CSIO, Chandigarh. The meeting was chaired by Dr Kota Harinarayana, Vice-Chancellor, University of Hyderabad, Hyderabad. Dr RP Bajpai, the then Director, CSIO extended a warm welcome to the Chairman and Members of the Research Council. He placed on record the appreciation of Director and staff of CSIO for the direction and guidance provided to CSIO by the Chairman and Members of the Outgoing Research Council. Dr Bajpai then gave an overview of the significant achievements and activities of CSIO, including Service & Maintenance (S&M) Centres and Indo-Swiss Training Centre (ISTC) during the past few years.

Shri SR Taneja, Scientist G, CSIO, in his presentation, highlighted the performance and achievements of the Institute during the last three years, strategic positioning vis-à-vis-vision (road map of CSIO) and R&D programmes under execution. The detailed aspects specifically covered in the presentation were SWOT Analysis of CSIO, CSIR

Networked Programmes under Execution and Action Taken on the Recommendations of the Performance Appraisal Board.

The Chairman, Dr Kota Harinarayana observed that during the last few years, CSIO had made remarkable progress which was evident from significant increase in the number and value of R&D projects undertaken, ECF generated, patent applications filed, technologies transferred etc. The Chairman also appreciated CSIO for developing large number of products and technologies.

The Research Council congratulated Dr RP Bajpai for receiving "Vigyan Gaurav Samman" for the year 2003-04 from the Council of Science & Technology, Department of Science & Technology, Government of Uttar Pradesh. The RC Members complimented Sh NS Mehla, Scientist F; Shri SC Jain the then Scientist EII; Dr AK Aggarwal, the then Scientist G and Dr RP Bajpai, the then Director, CSIO for receiving K Suryanarain Rau Memorial Award-2004 for Smart Technology Development.

SIGNING OF MoUs

In its endeavour towards accomplishing the societal mission, CSIO signed a MoU on August 7, 2004 with Government Medical College & Hospital (GMCH), Chandigarh for Joint Collaborative Programme in the area of academics, especially, for running of B.Sc. (Ophthalmic Techniques) course. The MoU envisages for providing teaching /training faculty/ facilities in the field of spectacle making and related optics by CSIO to students of B.Sc. (Ophthalmic Techniques) of GMCH. There will be mutual sharing

of infrastructural facilities by the two institutes to promote the collaboration.

Another MoU was signed between CSIO and Bhabha Atomic Research Centre (BARC), Trombay by Dr RP Bajpai of CSIO & Dr VK Suri of BARC, for carrying out the feasibility study for Development of Super Precision Optical Components in the domain of Nano-technology. BARC is a premier multidisciplinary organization under Department of Atomic Energy, Government of India engaged in

Major Events & Activities



Dr RP Bajpai & Dr VK Suri Signing the MoU

research with the objective of generating knowledge and techniques for the nuclear power production, advancement of science, use of radioisotopes in the industry, health & agriculture and research in frontier areas of Science & Technology. Since CSIO has the expertise in high precision Single Point Diamond Turning (SPDT) machine and precision metrology required for the development of Super Precision components, it can well supplement the efforts of BARC.

CSIR FOUNDATION DAY & HINDI FORTNIGHT CELEBRATION



Prof. OP Bajpai Distributing Prizes to Staff Members

Chandigarh delivered a lecture on the subject "Hyper-Spectral Imaging". Prof. Bajpai in his address said that hyper spectral imaging, which is 'spectral signature' of a material, is one of the modern techniques for exploration using satellites. He explained that hyper spectral imaging finds uses in diverse applications like medical diagnosis, target detection and recognition, chemical detection and cloud tracking, Earth resources and remote sensing. He elaborated the technical issues and applications associated with multispectral and hyper spectral imaging.

CSIR Foundation Day was celebrated by holding an Open Day at CSIO on 26th September, 2004. All the labs of CSIO were kept open for the general public. A large number of visitors, including the students from various schools, engineering colleges, university and the general public went around various laboratories of the organisation. This provided them a unique opportunity to see the live demonstration of the instruments developed at CSIO and a chance to interact with the scientists.

Prof. OP Bajpai, Director, National Institute of Technical Teachers' Training and Research,



Shri AK Dimri Explaining to the Students

Major Events & Activities

All the staff members of CSIO, who had completed 25 years of regular service in CSIR and those who retired during the period September 2003 to August 2004 were honoured by presenting them mementoes and shawls. CSIO also concluded the celebrations of Hindi Pakhwara on the day. The programme ended with the awarding of prizes by the Chief Guest to the winners of various competitions held earlier as a part of CSIR Foundation Day and Hindi Fortnight Celebrations.

CSIO also celebrated Hindi Pakhwara from September 14 to 26, 2004. During the fortnight various competitions were organized to encourage the progressive use of Official Language Hindi in day to day work. These competitions received an overwhelming response as a large number of employees participated in them. The Chief Guest gave away the cash prizes.

DR PAWAN KAPUR TAKES OVER AS DIRECTOR CSIO



Dr Pawan Kapur at Director's Desk

Dr Pawan Kapur assumed the charge of Director, CSIO, Chandigarh on 15th October, 2004.

Born on 9th December, 1950 at Amritsar, Dr. Kapur obtained his B.Sc. (Physics Hons.), B.Tech., M.Tech. and Ph.D. (Biomedical Engineering) from University of Kolkata, joined CEERI, Pilani in the year 1975 where he relinquished his office as Scientist 'G' and Decision Unit In-charge, Electronics for Environment, Industry and Society. He has guided several projects on Process Control Instrumentation for various agro-based industries such as Sugar, Tea, Mushroom

Farming, etc. and transferred the technology after long term user trials. Some of his significant works include Fuzzy Logic based Pan Automation System implemented at Ramgarh Chini Mills (U.P.), Monitoring and Control Instrumentation System commissioned at National Research Centre for Mushroom at Solan, Intelligent Withering Trough Automation System developed and currently working in about 20 different tea estates in Assam and West Bengal. The R&D on Integrated Automation of Tea Processes has been successfully implanted at the Model Tea Factory at Tea Research Association, Jorhat, which has been recently inaugurated by the Honourable Chief Minister, Government of Assam. He has been the Nodal Officer from CEERI on CSIR Networked Project on "Electronics for Societal Purposes" and deeply associated with CSIO-teams working on this programme. Dr Kapur has to his credit over 80 research papers in journals and conference proceedings, 4 patents, 6 products, 4 book-chapters and guided more than 50 students for their dissertation work. He is a recipient of several awards including ELCINA (1985), CSIR Technology Shield (1992), IETE KS Krishnan Memorial Award (1992), STAI Sugar Cup (1973), 7th Hari Ram Toshniwal Gold

Major Events & Activities

Medal (1995), STAI Silver Medals (1997, 1998), Noel Deer Gold Medal (2003) for successful commercialisation of technology by Ramgarh Chini Mills, Ramgarh (U.P.).

He delivered the prestigious 6th Prof SK Mitra Birth Centenary Lecture (Kolkata) and 3rd Assam Company Lectures (Jorhat).

Dr Kapur was on deputation abroad to countries like Germany, Australia, France, Hungary, UK, Brazil, USA, Mauritius and Singapore in connection with advanced research and studying instrumentation

developments for agro based industries.

Dr Kapur is a Fellow of Institution of Electronics & Telecommunication Engineers, Fellow-Sugar Technologist Association of India, Member-International Sugar Industry Association, Member-Bureau of Indian Standards, etc. His areas of specialization are intelligent instrumentation, process automation, soft-computing, biomedical engineering, modelling & simulation and electronic perception analysis.

CSIO FOUNDATION DAY



Prof Surendra Prasad Releasing CSIO's Annual Report 2003-04

CSIO celebrated its Foundation Day on 30th October, 2004 by organising a guest lecture by Prof Surendra Prasad, the then Deputy Director, I.I.T. Delhi on 'Perspective in Signal Processing' in CSIO Auditorium. Prof. Surendra Prasad in his address explained various aspects of signal processing techniques and their applications in fields of

communication, entertainment, instrumentation, medicine and defence. With numerous examples for common man, he explained the benefits that technology has reaped from this field. He also outlined its future applications.

Earlier, Dr Pawan Kapur, Director, CSIO welcomed the Chief Guest and highlighted the significance of CSIO Foundation Day. He while mentioning the achievements of CSIO, informed the august gathering that this year has been a year of successes and achievements for CSIO as a number of technologies in various fields have been transferred to industries. Annual Report of the organization for the year 2003-04 was also released on this occasion by Prof. Surendra Prasad.

On this occasion, two students of Haryana School Education Board belonging to SC category were also awarded Rs. 3000/- each for scoring maximum marks in science.

VIGILANCE AWARENESS WEEK



Dr Pawan Kapur Speaking on the Occasion

Vigilance Awareness Week was celebrated in CSIO during November 1-6, 2004. It was organized in accordance with the instruction issued by Central Vigilance Commission and forwarded to Central Scientific Instruments Organisation by Chief Vigilance Officer of CSIR.

The week long celebrations began with the oath taking ceremony; wherein the Director, CSIO administered the CSIO staff the oath of honesty on November 01, 2004. On the same day lecture was delivered by the senior officials of the organisation. Shri Basudeo Prasad, Scientist delivered a lecture on "Awareness Towards Corruption in R&D" Shri A.K.

Mittal, Controller of Stores & Purchase spoke on the topic "Awareness towards Corruption in Stores & Purchase Matters"; while Shri SC Juneja, Sr Finance & Account Officer talked upon "Awareness Towards Corruption in Financial Matters".

A poster competition was also organized on November 02, 2004 for the wards of CSIO employees and a lecture by Shri Mukesh Chaturvedi, Dy Director, ISTM, New Delhi was also organized on November 05, 2004 as part of this celebration. He spoke about



Staff Members Taking Oath on the Occasion

the central Civil Services (Conduct) Rules.

Winners of the Poster Making Competition were awarded prizes by the Director, CSIO.

CSIR PROGRAMME ON YOUTH FOR LEADERSHIP IN SCIENCE



Prof SC Dutta Roy Delivering the Inaugural Address

CSIR Programme on Youth for Leadership in Science (CPYLS) was inaugurated on December 6, 2004. Prof. SC Dutta Roy, Professor Emeritus, IIT, Delhi while inaugurating the programme opined that engineering is not the end of the world. There are many other alternative, gainful and enjoyable careers that one can follow. The most prominent among them is science. He advised the participants to put their heart and soul in studies, to consider science as a serious option for further studies, teaching and/or research as a career option and also to consider staying back in the country and to do whatever possible for the betterment of the nation.

Major Events & Activities



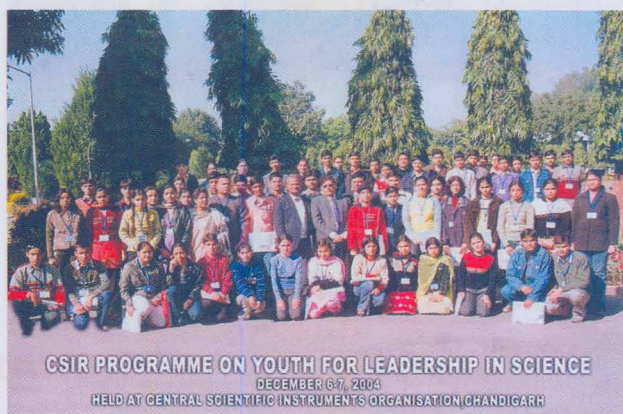
Shri SR Taneja giving Prize to Student

Prior to this, while welcoming the guests, Dr Pawan Kapur, Director, CSIO emphasized upon the need to opt for career in science, which gives fulfillment besides providing umpteen opportunities for self-growth and contribution to the human society. He mentioned that in the present age, boundaries between various

science streams are becoming fuzzy and science has become a global affair. He gave an overview of various areas which are being pursued in CSIO from Glory Alert System to Nanotechnology and stressed to brace up the knowledge to compete with the world.

During their two days stay at CSIO, students were taken around various labs of CSIO to get a feel of how an actual R&D work place looks like and to see

various instruments that they had only read about. Students also got an opportunity to closely interact with the researchers in various laboratories where experiments have specially been set up for them to help them understand basic principles of how things



work.

A multimedia science quiz competition was also organized for the participating students. Popular science lectures by the scientists of CSIO were also arranged for the students to inspire and motivate them to develop a scientific temperament.

This programme is a part of CSIR mission for attracting young and brilliant minds in science stream and is organized throughout the country everywhere. About 70 students from Haryana State participated in this 2-day programme.

CSIO-INDUSTRY MEET AT JAIPUR



Dr Pawan Kapur Apprising Shri Rakesh Huja About CSIO Technologies

A CSIO-Industry Meet was held on 10th February, 2005 in collaboration with Rajasthan State Industrial Development & Investment Corporation Ltd. (RIICO), Jaipur for promotion of scientific industry in Rajasthan for agro-based instrumentation. Technologies developed by CSIO for agro-based industry were displayed. All participants took keen interest and interacted with scientists about the instruments developed by CSIO. Main attraction of the workshop was gold analyzer and three dimensional holographic display of jewellery and monuments of historic importance.

Major Events & Activities



Demonstration of Working Instruments During the Meet

Dr Rakesh Huja, IAS, Chairman & Managing Director, RIICO, the Chief Guest on the occasion, declared that RIICO will be developing agro-based testing labs in Rajasthan initially at Kota, Jodhpur and Sriganganagar in collaboration with CSIO. Dr Pawan Kapur, Director, CSIO highlighted main achievements of CSIO regarding development of technologies in different areas especially agro-based technologies. Dr Kapur also explained the various technologies successfully transferred for commercialization to industries.

NATIONAL SCIENCE DAY



Prof. M.L. Munjal Speaking on the Occasion

Central Scientific Instruments Organisation celebrated "National Science Day" by holding an 'Open Day' on 28th February, 2005. All the labs of CSIO were kept open for the general public. A large number of visitors including the students from various schools, colleges, university and general public went around various laboratories of the organisation. They interacted with the scientists and were given exposure to the technologies developed at the CSIO.

Prof ML Munjal, Chairman, Department of Mechanical Engineering, Indian Institute of Sciences, Bangalore, delivered a lecture on "Designing for Quietness". Prof Munjal, in his lecture highlighted the noise control

strategies for various applications. In the area of noise, like in several other areas, he stressed prevention is better than cure. It is much more cost effective to use a silent technology in the manufacturing process than to make use of the post-manufacturing noise control measure as a retrofit.

Prior to this, Dr Pawan Kapur, Director, CSIO while welcoming the Chief Guest highlighted the significance of National Science Day and said that scientific methodology is required in every walk of life. He said that National Science Day celebration this year has become all the more important since the UN has declared this year i.e. 2005 as "International Year of Physics" and about 30 countries all over the world are participating in the 100th anniversary of "Einstein's Theory of Relativity". He also highlighted the future plans of CSIO and generating the definition of CHANGE in his own words, where C stands for Core Competence, H for Higher Knowledge, A for Adaptation, N for Networking, G for Globally competitive and E for Excellence, he called upon the CSIO Staff to put in rejuvenated efforts to take CSIO to new heights and to make it an apex body in instrumentation policy and HRD growth in instrumentation.

Activities at S&TM Centres

- **R&D Activities**
- **Service & Maintenance Activities**
- **Training Programmes Organised**
- **Energy Audit Activity**



R&D Activities

Over the years, the Service and Maintenance (S&M) Centres located at Delhi, Jaipur & Chennai have developed expertise in some specific areas. The S&M Centre, Delhi has gained expertise in the area of Instrumentation for Strategic & Defence Applications. In the recent past, it has developed few technologies in which two most important ones are Non-Linear Junction Detector (NLJD) and Electronic Stethoscope. The technologies have specific relevance with ever increasing threats of terrorism. NLJD is a portable field-operated hand-held system based on the Harmonic Radar principle. It aids the security personnel in the search of bugging devices and other concealed electronic items such as timers or remotely controlled devices. Electronic

Stethoscope is a search tool (for EOD & IEDD) helpful in bomb disposal and police work. Similarly, the Jaipur Centre has earned the confidence of the industry in the State of Rajasthan. The Centre has been approached by Rajasthan State Industrial Development and Investment Corporation Ltd. (RIICO), Jaipur for establishing the Test Laboratories for Quality Assurance of their products. S&M Centre, Chennai has established itself as a R&D Centre in the area of Energy Management Instrumentation. It has successfully completed a consultancy project on Energy Management System under Indo-German Energy Efficiency & Environment Project (IGEEP). During the year, the Chennai Centre has completed following R&D Projects:

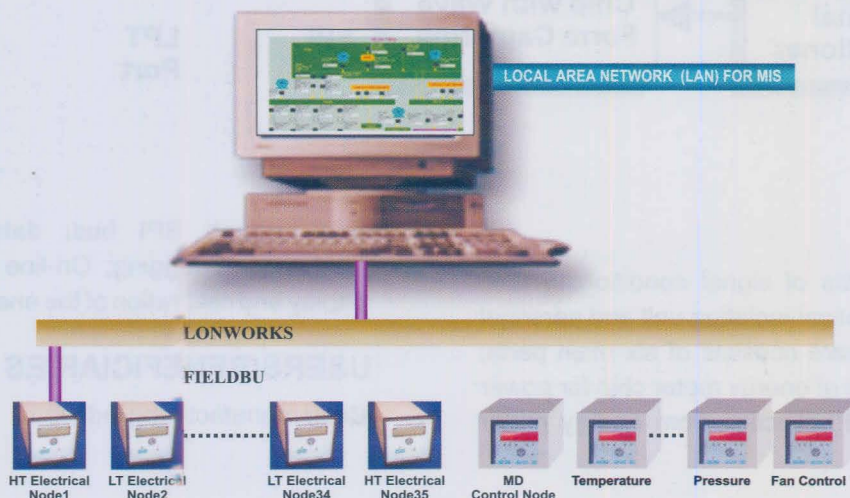
On-line Energy Monitoring and Control System and Its Installation in an Industry

Sponsored by
DST, New Delhi

India's present commercial power generation capacity is one lakh MW. The demand is expected to increase to two lakhs MW by the year 2010. Such a scenario requires urgent need for industrial energy conservation. One of the methods of achieving conservation is the use of energy monitoring and control system in industries.

DESCRIPTION

The above system is based on LonWorks network technology having a Flat Distributed Control System architecture with the hardware and software optimised for Energy Management. The system can handle measurements from electrical energy transmitters (energy nodes), oil flow meters, gas flow meters, steam flow meters, temperature transmitters,



Block Schematic of Energy Management System

R&D Achievements

compressed air flow transmitters (such as analog I/O nodes or physical nodes), product output transmitters (digital I/O nodes) etc. The reports can be generated as per the requirement of user either in tabular or in graphical forms. It builds the database for dynamic evolution and in archival reports. The system consists of energy node, physical node, cooling tower fan control node and demand control node.

UNIQUENESS/NOVELTY

- Distributed flat architecture networks
- Twisted pair backbone channel for communication up to 1.25 MBPS

- Twisted pair transceivers
- Energy Nodes with single chip comprehensive electrical measurements
- Physical parameter node (Temperature, Pressure, Flow Rate, mV, mA)
- Gateway interfaces for connecting the network to internet
- Flexibility to connect third party systems

USERS AND BENEFICIARIES

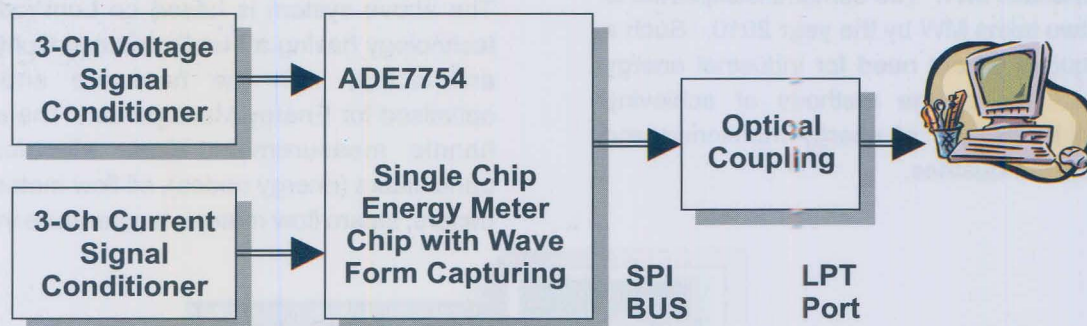
BHEL, Ranipet

Development of Low Cost Power Quality Analyser

In House Project

To enhance the industrial production and economy and to enable it to face the stiff global competition, cutting-edge technology of real time power quality

monitoring is very essential. The objective of this project is to develop the laboratory prototype energy meter with power quality features.



Block Diagram

DESCRIPTION

The hardware consists of signal conditioning unit, energy meter chip, optical-isolating unit and personal computer while software consists of six main parts; namely, Configuration of energy meter chip for power quality analysis; data collection from energy meter

chip through SPI bus; data processing; data monitoring & logging; On-line & Off-line graphical display and calibration of the energy meter chip.

USERS/BENEFICIARIES

Meter manufacturing industry

R&D Achievements

Development of Portable Energy Audit Tool for Power and Energy Measurement

In House Project

In order to carry out effective energy audit studies, low cost equipment is important. The developed system enables the display of real time data and demonstrates the concepts of energy savings. The embedded multitasking microcomputer modules with built-in RTC, ADC, Flash & RAM memory, SPI bus and inexpensive single chip ICs for comprehensive measurement of electrical parameters has facilitated its development.



Portable Energy Audit Tool for Power and Energy Measurement

DESCRIPTION

The Portable Energy Audit Tool (PEAT) has the following main features:

- 1-channel of 3 ϕ power & energy measurement
- 4-channel analog input
- 8-channel digital input
- 1MB RAM

SPECIFICATIONS

Voltage input	: 270 V rms (max)
Current input	: clamp-on CTs with 330 mV rms (max)
Analog input range	: 4-20mA DC
Digital input	: 0/24 V DC
Processor	: Pentium III or above
RAM	: 64 MB or above
Working platform	: Windows 98/ 2000/ XP
Others	: One free COM port

Service & Maintenance Activities

Repair & maintenance service of scientific and industrial instruments is one of the important activities of Service & Maintenance Centres at Chennai, Delhi & Jaipur and S&M Division at Chandigarh. Its objective is to reduce downtime of sophisticated instruments in different Hospitals/Medical Institutes, Universities/Research Institutes, etc. and to create awareness about preventive maintenance. Repair of some of the instruments involve developmental work by redesigning circuits with available components and sometimes it is carried out to improve the performance of the instruments. These Centres not only put back to use defective instruments but also contribute towards saving of a large amount of foreign exchange which would have otherwise been spent on import of the substitutes. Thus, these Centres are playing a stellar role in revitalising instruments worth several crores of rupees and bringing about considerable savings in national resources.

MAJOR SERVICE ACTIVITIES

- Repair & maintenance of instruments on job to job basis
- Annual Maintenance Contract (AMC) servicing of instruments ensuring minimum down time to the extent possible by conducting periodic visits wherein repair & maintenance responsibility with respect to instrumentation is that of the S&M Centres

- Undertake design & development work necessitating circuit modifications in respect of instruments where spares are either too costly or are not available
- Provide test and calibration services
- Undertake installation and commissioning jobs
- Offer services for establishing instrumentation facilities including advice on procurement of appropriate type of instruments

OTHER ACTIVITIES

- Undertake Entrepreneurial Development Programmes (EDPs) by organising regular programmes with a view to generating a cadre of private S&M entrepreneurs in the Country (This is done as a step towards solving the perennial national problem of instrument maintenance)
- Conduct training courses for users on operation, handling and preventive maintenance of instruments
- Impart on-job training to students of Polytechnics & Engineering Colleges
- Organize Management Development Programmes on Operation, Maintenance & Repair of Bio-Medical and Analytical Equipment for the participants from the third world countries
- Provide energy audit services

S&M / CALIBRATION SERVICES RENDERED

(Amount in Rs.)

S&M Centre/ Division	No. of Instruments* Repaired	Apprx. Value of Instruments Repaired	Service Charges Levied (including Contract Servicing)
Delhi	786	202.00	9.715
Jaipur	108	34.75	3.283
Chennai	3067	270.00	23.471**
Chandigarh	170	50.00	2.280
Total	4131	556.75	38.749

* Including instruments calibrated
 ** Excluding energy audit charges of Rs. 8.487 lakhs

Service & Maintenance Activities

CONTRACT SERVICING

S&M Centre, Delhi

(Amount in Rs.)

Name of the Party	Name of the Instrument	Qty	Period	AMC Charges
Computer Division, CSIR, New Delhi	Voltage Stabilizer & CVT UPS	95	01 .04 .04-	50,000
		60	31 .03 .05	50,000
Dr. Ram Manohar Lohia Hospital, New Delhi Eye Department	Slit Lamp (Zeiss)	02	01 .04 .04-	1,23,600
	Slit Lamp (Techno Optical Model)	02	31 .03 .05	
	Slit Lamp (Gardian)	01		
	Operating Microscopes	04		
	i) OPMI 1 Zeiss (1 No.)			
	ii) OPMI 6 Zeiss (1 No.)			
	iii) OM 5 Takagi (2 Nos.)			
Synaptophore	01			
Indirect Ophthalmoscope	04			
Keratometer	01			
ENT Department	Operating Microscopes (Bel, Zeiss) Cold Light Source	02	01 .04 .04-	16,900
		03	31 .03 .05	
Bio-Chemistry	Cell Counter Digital	05	01 .04 .04-	20,000/-
	Photoelectric Colorimeter	02	31 .03 .05	
	Cell Counter Mechanical	26		
Pathology, Histopathology, Skin, Blood Bank, CCU, Cytology & Microbiology Department	Water Bath	21	01 .04 .04-	1,88,500
	Hot Air Oven	11	31 .03 .05	
	BOD Incubator	05		
	Incubator	06		
	Centrifuge Machine	35		
	Microscope (Monocular & dark ground)	35		
Microscope (Binocular)	40			
Cardiology Deptt. Nursing Home Emergency Ward	ECG Machine	30	01 .04 .04- 31 .03 .05	1,05,000
Physiotherapy Deptt.	Microwave Diathermy Phyaction Unit	02	01 .04 .04-	10,500
		01	31 .03 .05	
Deen Dayal Upadhyay Hospital, New Delhi			05 .07 .04- 04.07.05	71,300
Pathology Department	Hot Air Oven	02		
	Centrifuge Machine	10		
	Water Bath	04		

Service & Maintenance Activities

(Amount in Rs.)

Name of the Party	Name of the Instrument	Qty	Period	AMC Charges
	Microscope (Binocular)	11		
	Tissue Flostation Bath	01		
	Needle Destroyer	57		
	Rotary Microtone	03		
	Chemical Balance	01		
	Digital Incubator	03		
	Digital Colorimeter	04		
	pH Meter (Digital)	01		
	Centrifuge Machine	01		
	Spectrophotometer	02		
	Electrophorasis Apparatus	01		
	Warming Table	03		
Eye Department	Lensometer	01	10 .07 .04-	1, 41, 180
	Keratometer	03	09 .07 .05	
	Slit Lamp-Hagg Street Model	01		
	Appaswamy Model	03		
	Synaptophore	01		
	Welch Allyn Examination Light	02		
	Indirect Ophthalmoscope	06		
	Ophthalmoscope (Welch Allyn)	14		
	Streek Retinoscope (Welch)	12		
	Auto Refractometer-110 (Zeiss)	01		
	Wall Charger	24		
	Desk Charger	05		
	Operating Microscopes	02		
Guru Nanak Eye Centre, New Delhi	Keratometer	10	01 .04 .04-	2, 03, 000
	Slit lamp	20	31 .03 .05	
	Syanptophore	06		
	Lens Screen	02		
	Operating Microscope	08		
Lady Harding Medical College & Hospital, New Delhi	Spectrosonic 21-D	01	15 .08 .03- 14 .08 .04	7,500
	Microscope (Monocular)	50	01.09.04- 31.08.05	27,500
	Microscope (Monocular)	50	01.03.05- 28.02.06	27,500
NPL, New Delhi	EPR Spectrophotometer	01	20 .11 .04- 19 .11 .05	25, 000
Attar Sain Jain Eye & General Hospital, New Delhi	Synaptophore	01	01 .04 .04-	24, 800
	Direct Ophthalmoscope (Welch Allyn)	04	31 .03 .05	
	Direct Ophthalmoscope (Keeler)	02		
	Streek Retinoscope	04		

Service & Maintenance Activities

CSIO Centre, Jaipur

(Amount in Rs.)

Name of the Party	Name of the Instrument	Qty	Period	AMC Charges
Rajasthan Medical Relief Society (RMRS), Jaipur	X-Ray Machine	1	01.08.03-31.07.04	15,000
Santokba Durlabji Memorial Hospital, Jaipur	Balanced Cell	2	01.01.04-31.12.04	16,000
	Colorimeter	1		
	Flame Photometer	1		
	Electrophoresis Power Supply	1		
	Spectrophotometer	2		
Frozen Semen Bank, Bassi, Jaipur	Incubator	2	01.08.04-31.07.05	29,500
	Cold Handling Cabinet	2		
	Electronic Monopan Balance	1		
	Spectronic-20	1		
	Hot Air Oven	1		
	Autoclave	1		

S&M Centre, Chennai

(Amount in Rs.)

Name of the Party	Name of the Instrument	Qty	Period	AMC Charges
TWAD Board, Chemical Lab, Chennai	Analytical and Lab Instruments	63	24.05.2004 - 23.05.2005	58,000
NITTTTR, Chennai	Lab. Instruments	26	01.04.2004 - 31.03.2005	15,000

S&M Division, Chandigarh

(Amount in Rs.)

Name of the Party	Name of the Instrument	Qty	Period	AMC Charges
The State TB Officer, Chest Clinic, Sector 22, Chandigarh	Microscopes	10	26.05.2003-25.05.2005	20,000 (@ Rs.1,000 per Microscope per year)

Training Programmes Organised

S&M Centre, New Delhi

Title	12 th Management Development Programme on Operation, Maintenance & Repair of Bio-Medical Equipment (Under ITEC/SCAAP Programme)
Organised by	S&M Centre, New Delhi (4 weeks), S&M Centre, Jaipur (1 week) and S&M Division, Chandigarh (3 weeks)
Sponsored by	Ministry of External Affairs (Govt. of India), New Delhi
No. of Delegates	14
Countries Represented	Armenia, Georgia, Iraq, Senegal, Palestine, Ghana, Sri Lanka, Mozambique & Kenya
Period	September 15, 2004 - November 9, 2004 (8 weeks)
Broad Schedule	Lectures, Hands-on Sessions and Study Tours

Title	5 th Management Development Programme on Operation, Maintenance & Repair of Analytical Equipment (Under ITEC/SCAAP Programme)
Organised by	S&M Centre, New Delhi (4 weeks) and S&M Division, Chandigarh (4 weeks)
Sponsored by	Ministry of External Affairs, Govt. of India, New Delhi
No. of Delegates	14
Countries Represented	Sudan, Iraq, Bangladesh, Thailand, Benin, Grenada, Costa Rica, Algeria, Nicaragua & Mauritius
Period	January 19, 2005 - March 15, 2005 (8 weeks)
Broad Schedule	Lectures and Hands-on Sessions

Title	Training Programme on Repair & Maintenance of Bio-Medical Instruments for Hospital Technicians / Doctors at New Delhi
Organised by	S&M Centre, New Delhi
Sponsored by	Department of Science & Technology (DST), New Delhi
No. of Participants	30
Period	May 17 - 28, 2004
Broad Schedule	Lectures and Hands-on Sessions

Training Programmes Organised

Title	Training Programme on Repair & Maintenance of Bio-Medical Instruments for Hospital Technicians / Doctors at Army Hospitals of Leh, Srinagar and Delhi
Organised by	S&M Centre, New Delhi
Sponsored by	Department of Science & Technology (DST), New Delhi
No. of Participants	25 at Delhi and 38 at Srinagar
Period	Delhi : Oct. 4 - 14, 2004; Srinagar Oct. 28, 2004 - Nov. 08, 2004
Broad Schedule	Lectures and Hands-on Sessions

Title	Training Programme on Repair & Maintenance of Bio-Medical Instruments for Hospital Technicians / Doctors of Govt. Hospitals at Jammu
Organised by	S&M Centre, New Delhi
Sponsored by	Department of Science & Technology (DST), New Delhi
No. of Participants	25
Period	Jan. 03-14, 2005
Broad Schedule	Lectures and Hands-on Sessions

Title	CSIO Training Programme on Repair & Maintenance of Bio-Medical Instruments for Technocrats from various Units of Armed Forces
Organised by	S&M Centre, New Delhi
No. of Participants	12
Period	March 14-28, 2005
Broad Schedule	Lectures and Hands-on Sessions

Training Programme on Repair & Maintenance of Optical & Ophthalmic Instruments

One week training was conducted for three engineers of M/s MNE Technologies Pvt. Ltd., Bangalore during the last week of December 2004. The practical training

included operation, repair & maintenance of optical and ophthalmic equipment with special emphasis on microscopes.

Training Programmes on Testing of Home Appliances

Mr. Nasser Al Dbhais from Quality Laboratory, SASO, Riyadh, Saudi Arabia attended the training at S&M Centre, Delhi from April 19 to May 6, 2004. Mr. Ali Ali

Saleh Al Masileem from Quality Control Laboratory, SASO, Riyadh, Saudi Arabia also attended the similar training from May 3 to 25, 2004.

Training Programmes Organised

CSIO, Jaipur Centre

Title	Training Programme on Preventive Maintenance & Repair of Bio- Medical Instruments for Hospital Technicians / Doctors	
Organised by	CSIO, Jaipur Centre	
Sponsored by	Department of Science & Technology (DST), New Delhi	
No. of Participants	25 per programme for each zone	
Period	Jaipur Zone (held at Jaipur)	November 29 - December 08, 2004
	Ajmer Zone (held at Jaipur)	December 14 -23, 2004
	Bikaner Zone (held at Bikaner)	January 10 - 19, 2005
	Jodhpur Zone (held at Jaipur)	February 15 - 24, 2005
	Kota Zone (held at Jaipur)	March 10 - 19, 2005
Broad Schedule	Lectures & Hands-on Sessions	

Title	Entrepreneurship Development Programme (EDP) on Preventive Maintenance & Repair of Bio- Medical Instruments	
Organised by	CSIO, Jaipur Centre	
Sponsored by	Entrepreneurship & Management Development Institute (EMI), Jaipur	
No. of Participants	20	
Period	August 16, 2004 - September 10, 2004 (4 weeks)	
Broad Schedule	Lectures & Hands-on Sessions	

S&M Centre, Chennai

Title	Training Programme on Repair and Maintenance of Bio-Medical Instruments for Hospital Technicians/Doctors at Salem, Thanjavur, Kanyakumari and Tuticorin	
Organised by	S&M Centre, Chennai	
Sponsored by	Department of Science & Technology (DST), New Delhi	
No. of Participants	25 at Salem	
Period	March 7-18, 2005	
Broad schedule	Lectures & Hands-on Sessions	

Energy Audit Activity at S&M Centre, Chennai

The S&M Centre, Chennai has been providing services of energy audit. It has been accredited by the Bureau of Energy Efficiency and recognized as Energy Audit Agency by the Tamil Nadu Electricity Board (TNEB) and Petroleum Conservation Research Association (PCRA). The Centre has developed expertise for conducting energy audit in Textile Industry, Pumping Stations, Water Supply Schemes, Hospitals etc. The Centre has

conducted energy audit in few CSIR laboratories and established energy saving potential.

During the year 2004-05, the CSIO's Chennai Centre has provided energy audit services to various parties. These included TWAD Board, Chennai; Continental Carbon India Limited, Ghaziabad and Electro-Steel Limited, Kolkata, etc.

Human Resource Development

- **Indo-Swiss Training Centre**
- **Talks & Lectures Delivered**
- **Training Programmes Organised**
- **Conferences/Symposia/Workshops Attended**
- **Qualifications Improvement**
- **Visits Abroad**
- **Honours & Awards**



INDO-SWISS TRAINING CENTRE (ISTC)

ISTC



With rapid industrialization in the country, there had been a surging demand of middle level technologists in the area of instrumentation. In order to fulfill this requirement, a unique training centre, namely, Indo-Swiss Training Centre (ISTC) was established under the umbrella of CSIO,

Chandigarh in its sprawling campus in the year 1963 in collaboration with the Swiss Foundation for Technical Assistance, Switzerland.

With emphasis on skilled development, the training programmes have the right blend of practice and state-of-art knowledge, which makes the ISTC graduates a readily sought-after commodity by the modern industry, including multinationals. High-grade technical training is being imparted by conducting the following three courses:

- 3-year Diploma in Instrument Technology
- 4-year Advanced Diploma in Mechatronics & Industrial Automation
- 4-year Advanced Diploma in Die & Mould Making

TRAINING PHILOSOPHY

The programmes aim at developing a high level of proficiency by integrating theoretical and practical knowledge. Educational tours and Industrial attachment programmes provide exposure to the real life environment in industrial and R & D labs. Project report writing, organization of various seminars, group discussions and lectures play a useful role.

The Swiss lineage has created a work culture which attaches due importance to etiquettes, punctuality, cleanliness, good house-keeping, obedience, dedication and pride of labour.

The students are admitted to ISTC on the basis of an All India Entrance Test, conducted in the first week of August every year.

39TH CONVOCATION OF ISTC

"The acronym reading of ISTC as *Innovative Scientific Technological Commitment* to the nation as a whole and the industry in particular is absolutely befitting to it", Dr. AK Chawla, Vice Chancellor, Kurukshetra University, Kurukshetra expressed this view on the occasion of 39th Convocation of Indo-Swiss Training Centre of CSIO held on 30th July, 2005. He expressed hope that the Institute will continue its commitment of producing professionals with technical ability and leadership aptitude. Talking about ISTC, Dr Chawla lauded the efforts being put in by the Centre to generate highly skilled technical manpower to match the changing requirements of the industry. He also exhorted the students not to forget their culture and moral values in the race of materialism and high aspirations.

Earlier, Dr RP Bajpai, the then Director, CSIO highlighted the activities of ISTC and extended a hearty welcome to the Chief Guest. Dr Bajpai briefly touched upon the new initiatives taken up by CSIO especially in the area of Bio & Nanotechnology. He lauded the role of ISTC in the area of providing



Chief Guest Lighting the Lamp

INDO-SWISS TRAINING CENTRE (ISTC)



Chief Guest Delivering the Convocation Address

assistance to the industry by way of fabrication of press tools and development of critical components besides conducting the regular short-term courses for persons from the industry.

Shri HS Gupta, Principal, ISTC while presenting the annual report of the Training Centre, informed the gathering with pride that more than 90% of the passing out graduates had already been picked up for employment by various industries of repute and many

of them have been offered starting salary of over Rs. 12,000/- per month during training period. Efforts are being made to get the rest of the trainees also placed. He further said that the Centre had produced so far over 2,200 graduates in various streams.

Later, the graduating students were awarded diplomas and advanced diplomas by Dr Bajpai, the then Director, CSIO. The Chief Guest Dr AK Chawla gave away the prizes & medals to the students, who had excelled in various fields. During the year 2004-05, 66 students were awarded Diplomas/Advanced Diplomas on successful completion of their courses. 31 students passed out in Diploma Instrument Technology 15 in Advanced Diploma in Mechatronics & Industrial Automation and 20 in Advanced Diploma in Die & Mould Making.

Dr Bajpai, also gave away prizes to the winners of various sports events organised throughout the year in a function held on the eve of the convocation.

The programme was compered by Shri RC Arora and concluded with the formal vote of thanks proposed by Dr RK Jain.

QUALITY SYSTEM INITIATIVE

AICTE APPROVAL OF ISTC COURSES

An Expert Committee constituted by All India Council for Technical Education (AICTE), New Delhi and comprising of Prof TK Garg (Chairman), NIT, Kurukshetra; Prof BS Pabla, NITTTR, Chandigarh and Shri KM Jassal, Research Officer, Directorate of Technical Education, UT, Chandigarh visited ISTC on May 5, 2004 to verify the existing infrastructural and instructional facilities as per AICTE norms.

On recommendations of the Committee, AICTE has accorded approval to all the three ISTC courses for a further period of three years (2004-07).

NBA ACCREDITATION TO ISTC

A team of eminent educationists and scientists,



Members of NBA Team during the Concluding Session

constituted by National Board of Accreditation (NBA), New Delhi visited ISTC during July 24, 2004. The Committee comprising of Prof AK De (Chairman), Prof

INDO-SWISS TRAINING CENTRE (ISTC)

Emeritus, IIT, Mumbai; Shri Vinod Kumar, Scientist, CBRI, Roorkee; Dr HS Shan, IIT Roorkee; Prof AV Bhonsale, Sardar Patel College of Engineering, Mumbai; Prof N Ranapratap Reddy, NIT, Surathkal (Karnataka) and Prof BS Patro, Principal, College of Engineering & Technology, Ghatika, Bhubaneswar

visited all the ISTC facilities and had detailed discussions with the staff members.

On recommendations of the Committee, the NBA has accredited all the three courses at ISTC for a period of three years, w.e.f. September 10, 2004.

OTHER ACTIVITIES



Blood Donation Camp in Progress

BLOOD DONATION

ISTC students have always been coming forward for the noble cause. ISTC staff and trainees regularly participate in voluntary blood donation camps. During the year two blood donation camps were held. First blood donation camp was held in June 2004 and was sponsored by State Bank of India in which 120 students donated blood. Second blood donation camp was organized by ISTC itself in December, 2004 in which 130 trainees participated. PGI Chandigarh

honoured ISTC staff member, Shri MP Singh, for donating blood for the 50th time.

SPORTS ACTIVITIES

Inter-class matches for ISTC students were also arranged. Indoor matches included Chess, Badminton, Carrom, Table Tennis and Lawn Tennis whereas outdoor games included Volleyball, Football, Basketball and Cricket. Students also participated in open tournaments in and around Chandigarh. Girl trainees also participated in the sports and won prizes.

NCC ACTIVITIES

Annual NCC Training Camp was held at High Ground, Air Force Station, Zirakpur in October 2004 which was attended by 40 cadets. 35 NCC cadets participated in the Republic Day Parade on 26th January, 2005

ASSISTANCE RENDERED TO INDUSTRY

Assistance was rendered to outside agencies through job work. A short term training course on "CNC Milling Part Programming" was organised by ISTC during August 16-27, 2004. This course was attended by 5 trainees from Industry.

TALKS & LECTURES DELIVERED

Sr. No.	Topic	Event/ Venue	Date	Presenter
1.	Transmission Characteristics and Signal Degradation in Optical Fibers	Short-Term Course for Polytechnic College Teachers at NITTTR, Chd.	June 6, 2004	Subhash Chander Jain
2.	Fiber Optic Waveguides	Short-Term Course for Polytechnic College Teachers at NITTTR, Chd.	June 7-11, 2004	NS Aulakh
3.	MEMS in Disease Diagnosis	Department of Biotechnology, Govt of India, New Delhi	Aug. 16-18, 2004	LM Bharadwaj
4.	Optical Fiber Measurements	Short-Term Course for Polytechnic College Teachers at NITTTR, Chd.	Sept. 17, 2004	Subhash Chander Jain
5.	Urban Air Pollution and Health	Punjab State Council for S&T, Chd.	Sept. 29, 2004	S G Sharma
6.	Water Pollution and Health	Punjab State Council for S&T, Chd.	Sept. 29, 2004	Sangeeta Garg
7.	Fabrication & Testing of Aspheric Optics	Laser Science & Technology Centre (DRDO), New Delhi	Oct. 5, 2004	SV Rama Gopal
8.	Aspheric Optics Fab & Metrology	Metcalf House, DRDO, New Delhi	Oct. 5, 2004	S V Rama Gopal
9.	Modernisation of Tea Industry: Indian Scenario	CPYLS Programme, CEERI, Pilani	Oct. 27, 2004	Pawan Kapur
10.	Environmental Pollution & Monitoring Instruments	SD College, Chandigarh	Nov. 6, 2004	Basudeo Prasad
11.	Air Pollution and its Control	NIT, Rourkela	Nov. 20, 2004	S G Sharma
12.	Wonders of Optics	CPYLS Programme at CSIO, Chd.	Dec. 6, 2004	SV Rama Gopal
13.	Optical Waveguides	Short-Term Course for Engineering College Teachers at NITTTR, Chd.	Jan. 4, 2005	NS Aulakh
14.	Medical Applications of Optical Fiber	Short-Term Course for Engineering College Teachers at NITTTR, Chd.	Jan. 5, 2005	JK Chhabra
15.	Optical Sources and Detectors	Short-Term Course for Engineering College Teachers at NITTTR, Chd.	Jan. 5, 2005	NS Aulakh
16.	Fiber Optic Sensors	Short-Term Course for Engineering College Teachers at NITTTR, Chd.	Jan. 6, 2005	NS Mehla
17.	Industrial Automation: Some Case Studies	Easwari Engg. College, Chennai	Jan. 21, 2005	Pawan Kapur
18.	Synthesis & Characterization of Pd & Pt Nano Particles	Department of Chemistry, HP University, Shimla	Feb. 25-26, 2005	ML Singla
19.	Synthesis of Metal Nano Particles	National Symposium on Future Challenges in Chemical Sciences (FCCS-05) at Department of Chemistry, HP University, Shimla	March 9-11, 2005	ML Singla

Training, Conferences/Workshops

TRAINING PROGRAMMES ORGANISED AT CSIO



An Interactive Session in Progress

Human Resource Development Centre's (CSIR) Training Programmes on 'Accrual based Accounting System and IMPACT Software for the Finance Personnel of CSIR' were organized at CSIO, Chandigarh during November 22-26, 2004. Dr Pawan Kapur, Director, CSIO, Chandigarh inaugurated the programme. In the first group, during November 22-23, 2004, twentyseven trainees from different laboratories of CSIR such as RRL, Jammu; IHBT, Palampur; CDRI,

Lucknow; NBRI, Lucknow; CIMAP, Lucknow; MERADO, Ludhiana; ITRC, Lucknow; HRDC, Ghaziabad; IMT, Chandigarh and CSIO, Chandigarh attended the programme; In the second group, during November 25-26, 2004, twenty eight trainees from RRL, Jorhat; CGCRI, Kolkata; CFRI, Dhanbad; IICB, Kolkata, CMRI, Dhanbad; CMERI, Durgapur; HRDC, Ghaziabad; NML, Jamshedpur; IMT, Chandigarh and CSIO, Chandigarh attended the programme. During the programmes, several eminent experts from CSIR delivered lectures to the participants. Shri Sushil Kumar looked after the local arrangements including the conduct of technical sessions of the programme.



Faculty & Participants with Dr Pawan Kapur, Director CSIO

CONFERENCES/ WORKSHOPS ORGANISED

A Users' Workshop on "Explosive Detectors" was organized at CSIO, Chandigarh on January 5, 2005 by the Applied Physics Division of the Institute. More than 10 users from all over the country attended the

meeting and an interactive session amongst the users and R&D groups was held on the occasion. (Convener : Shri AK Dimri)

CONFERENCES/SYMPOSIA/ WORKSHOPS ATTENDED

S. No.	Name of Conference/ Seminar/ Symposium/ Workshop	Venue	Date	Participants
1.	XXVII Annual Meeting of EMSI and Conference on Electron Microscope and Allied Fields (EMSI-2004)	NPL, New Delhi	April 1-3, 2004	ML Singla, Mewa Singh, Shweta Sharma
2.	MEDICARE- 2004	Tafcon Projects Pvt. Ltd., New Delhi	April 6-8, 2004	Ram Ajore, VK Bhalla Sunita Kumari

Conferences/Symposia/Workshops Attended

S. No.	Name of Conference/ Seminar/ Symposium/ Workshop	Venue	Date	Participants
3.	International Symposium on Snow Monitoring and Avalanches (ISSMA-2004)	Snow & Avalanche Study Establishment, Manali	April 12-16, 2004	JK Chhabra, Satish Kumar, NS Aulakh
4.	National Conference on Opto Electronics and MEMS Technologies organised by IETE, Chandigarh Centre	CSIO, Chandigarh	April 16-17, 2004	SC Jain, RC Arora, SK Angra, ML Singla, Laxmi Pandey, Mewa Singh, PK Mahapatra, HS Walla, VK Sharma, Shweta Sharma, NS Mehla, GC Poddar, Ashu K Bansal, Vandana Mishra, Parvinder K., Rajesh Singh, VK Bindal, Monish Kumar, Sandeep Kumar, SG Sharma, RC Agnihotri
5.	Arbitration & Mediation in Intellectual Property Rights	FICCI, New Delhi	April 26-27, 2004	ML Singla, SK Angra, HK Sardana
6.	National Seminar on Physics & Technology of Sensors (NSPTS-10)	Vishwakarma Institute of Technology, Pune	April, 2004	Sunita Mishra
7.	Awareness-cum-Implementation Programme on ISO 9001 : 2000	Consultancy Development Centre, New Delhi	May 11-13, 2004	Jiwan Singh
8.	Management Development Programme on "Leadership: The Mantra for the New Millennium"	Lal Bahadur Shastri Institute of Management, New Delhi	May 19-20, 2004	SV Rama Gopal
9.	Bangalore Bio 2004	IISc, Bangalore	July 11-13, 2004	VKBhalla, Sandeep K.
10.	Symposium on Polytechnic Education Challenges and Future Directions	NITTTTR, Chandigarh	Aug. 16-17, 2004	HS Gupta
11.	Workshop on Molecular Biotechnology	B V Patel Education Trust, Ahmedabad	Aug. 23-27, 2004	Ellis Bagga, Sunita Kumari, Sandeep Kumar, Ram Ajore
12.	Training Course on "Basic Metrology and Uncertainty in Metrology"	National Physical Laboratory, New Delhi	Aug. 31 Sept. 3, 2004	Gurdial
13.	Presentation Skills for Managers	Gyan Jyoti School of TQM & Entre-preneurship, Mohali	Sept. 3-4 & 10-11, 2004	Jagvir Singh
14.	Workshop on Packaging of Optoelectronic Devices	SAMEER, Mumbai	Sept.4, 2004	NS Mehla
15.	Training Programme Project Management Organised by CSIR's Human Resource Development Centre, Ghaziabad	NPL, New Delhi	Sept. 16-18, 2004	Kulvinder Singh
16.	National Conference on Advanced Materials & Technology	DAV College, Amritsar	Sept. 24-26, 2004	Nathai Ram, C. Ghanshyam, Sunita Mishra, Satinder Singh

Conferences/Symposia/Workshops Attended

S. No.	Name of Conference/ Seminar/ Symposium/ Workshop	Venue	Date	Participants
17.	Technical Workshop on Smart Materials and Systems	NPL, New Delhi	Oct. 10, 2004	NS Mehla
18.	COSMID-2004 organised by DBT, Govt of India & Punjab State Council for Science & Technology	SD College, Sector 32, Chandigarh	Nov. 1, 2004	LM Bharadwaj
19.	International Symposium on Speech Technology Processing System	India Habitat Centre, New Delhi	Nov. 17-19, 2004	NK Sharma
20.	Scientific & Technical National Seminar	TBRL (DRDO), Ramgarh, Panchkula (Haryana)	Nov. 23-24, 2004	Subhash C Jain, GS Singh, SV Rama Gopal, GC Poddar
21.	R&D Management Conference (RDMC-04)	R&D Planning Division of CSIR, New Delhi	Dec. 6-7, 2004	NS Mehla, ML Singla, Kulvinder Singh, VP Giridhar
22.	Workshop on 'Recent Advances in Optics and Photonics' by Delhi Section of the Optical Society of America	IIT, Delhi	Dec. 20-21, 2004	Sushil Kumar, Subhash C Jain
23.	XXX Optical Society of India Symposium on Optics & Opto-Electronics (SOOP-2005)	NPL, New Delhi	Jan. 19-21, 2005	AK Aggarwal, Sushil Kumar, Subhash C Jain, GC Poddar, SV Rama Gopal, GS Singh, Charanjeet Singh, KT Santosh Kumar
24.	5 th International Seminar on Explosive Detection	NSG, Manesar, Gurgaon (Haryana)	Feb. 16-17, 2005	AK Dimri
25.	5 th International Conference on Advances in Metrology	NPL, New Delhi	Feb. 23-25, 2005	NK Sharma, HK Pir

QUALIFICATION IMPROVEMENT

- Shri C Ghanshyam, Scientist EII, has been awarded the degree of Doctor of Philosophy (PhD) in the Faculty of Sciences by Guru Nanak Dev University, Amritsar. The title of the thesis is "Study of Spin Coated Tin Oxide Gas Sensors"

VISITS ABROAD

- **Shri Subhash C Jain**, Scientist EII, undertook one-week training during September 8-14, 2004, on the maintenance and operation of KrF Excimer Laser (248 nm) at M/s Tui-Laser, Germering, Germany.

- **Shri Gufran S Khan**, Scientist, Aspherics Group was deputed to Germany for the period June 1, 2004 to September 30, 2005, under Indo-German DAAD Fellowship Programme 2004-05 (Sandwich Model). Shri Khan is working at the Institute for Optik, Information on Photonik, Max-Planck Forschungsgruppe, Universitat Erlangen-Numberg, Erlangen, Germany on the problem related to study of different Characterisation Methodologies for Aspheric based Advanced Optical Instruments at component level and system level.

SMART TECHNOLOGY AWARD

The Indian Society for Advancement of Materials and Process Engineering (ISAMPE), Bangalore has selected the work on Development of Extrinsic Fabry Perot Interferometric (EFPI) Sensor for Smart Technology Applications carried out by a team of CSIO Scientists, for its Annual K Suryanarain Rau Memorial Award for Smart Technology Development for the year 2004. The award was presented to the team comprising of Dr RP Bajpai, the then Director CSIO; Dr AK Aggarwal, the then Scientist 'G'; Mr NS Mehla, Scientist 'F' and Mr Subhash C Jain, Scientist EII during the 18th Annual General Meeting of ISAMPE held at the National Aerospace Laboratories (NAL), Bangalore on 30th July, 2004.

This sensor is quite important and will be useful for health monitoring of structures. It can be embedded / bonded with structures and materials with no degradation of the overall strength resulting in smart structures with built-in nervous system. The sensor prototype developed in the laboratory has shown encouraging results when its performance was compared with that of standard conventional strain gage. This sensor was developed under the project funded by the Board of Research in Nuclear Sciences (BRNS), Department of Atomic Energy, Govt. of India.

PANJAB RATAN AWARD

Dr RP Bajpai, the then Director, CSIO was honoured with Panjab Ratan Award at the Punjab & Haryana

State Intellectuals Conference held at Post Graduate Institute of Medical Education & Research, Sector 12, Chandigarh on September 12, 2004.

BEST SPORTS PERSON IN TABLE TENNIS

Shri BS Viridi, Scientist E II, CSIO was awarded on CSIR Foundation Day 2004 for having been adjudged the best sports person in Table Tennis (Men) Individual in CSIR for the year 2003-04 based on his performance in XXXVI Sri Shanti Swarup Bhatnagar Memorial (Indoor) Tournament held at RRL-Thiruvananthapuram during November 28-30, 2003. The award included a cash amount of Rs 5,000/- and a Citation.

EMERITUS SCIENTIST

Dr AK Aggarwal, the then Scientist G and Head, Coherent Optics Division of CSIO, Chandigarh was selected as Emeritus Scientist on superannuation, in recognition of his outstanding contribution in Research, Design and Development of advanced instrumentation and techniques for a variety of scientific & industrial applications. He is currently working at CSIO for development of machine-readable counterfeit-proof high security holograms for various strategic applications and development of fiber Bragg grating technology for communication and smart sensing applications for aerospace and civil structures.

Patents & Publications

- **Patents Granted**
- **Patents Filed**
- **Papers Published in Journals**
- **Papers Presented in Conferences/
Symposia**



Patents Granted

S. No.	Title	Inventors	Date of Filing	Grant Date	Patent No. (Country)
1.	Fiber Optic Temperature Switching Immersion Probe	Nahar Singh, SC Jain and AK Aggarwal	28.03.2002	27.04.2004	6726360 (USA)
2.	An Improved Antiglare Optical Devices for Automobile Useful During Night Driving	Deep Singh Chhabra, Parinam Krishna Rao, Bipin Dev Sharma, Sudhir Kumar Gupta, Dharambir Singh Dodd, Virender Singh, Sanjay Sharma	11.02.2002	14.10.2004	774644 (Australia)
3.	Fiber Optic Point Temperature Sensor	Subhash Chander Jain, Nahar Singh, GC Poddar, Rajneesh Talwar, Ashu Kumar Bansal & Ram Prakash Bajpai	25.03.2004	15.02.2005	6856714 (USA)

Patent Applications Filed Abroad

S. No.	Title	Inventors	Date of Filing	Application No.	Country
1.	A New Process for Lowering the Martensitic Transformation Temperature (As) in the Cu-Zn-Al (6% Al) Shape Memory Alloy for its Utilization	Vijay Rajaram Harchekar, Madan Lal Singla	12.4.2004	10/823423	US
2.	DNA based Number System and Arithmetic	LM Bharadwaj, AK Shukla, AP Bhondekar, R Kumar, RP Bajpai	20.5.2004	PCT/IB04/01639	PCT
3.	Fiber Optic Temperature Switching Immersion Probe	Nahar Singh, SC Jain AK Aggarwal	25.9.2004	*	Singapore
4.	A New Process for Controlled Blood Transfusion with Disposable Valve Circuit	KD Chattopadhyay S Verma, P Raj, J Gupta	25.9.2004	2004-7015464	Korea
5.	A New Process for Controlled Blood Transfusion with Disposable Valve Circuit	KD Chattopadhyay, S Verma, P Raj, J Gupta	27.9.2004	W00200402082	Indonesia
6.	Fiber Optic Temperature Switching Immersion Probe	Nahar Singh, SC Jain, AK Aggarwal	27.9.2004	P2003-578879	Japan
7.	Fiber Optic Temperature Switching Immersion Probe	Nahar Singh, SC Jain, AK Aggarwal	30.9.2004	2004-7015482	Korea
8.	Fiber Optic Temperature Switching Immersion Probe	Nahar Singh, SC Jain, AK Aggarwal	27.10.2004	02714410.4	European Union
9.	A New Process for Controlled Blood Transfusion with	KD Chattopadhyay, S Verma, P Raj, J Gupta Disposable Valve Circuit	2.11.2004	02828883.1	China

* not available yet

S. No.	Title	Inventors	Date of Filing	Application No.	Country
10.	An Improved Micro Controller based Oscillation Monitoring System for the Safety of Railway Vehicles with High Storage Capacity & Real Time Warning Facility	Sudesh Kumar Mittal, Maher Alam Shamshi, Sandeep Kalra, Bal Kishore Sharma	15.12.2004	PCT/IB04/04129	PCT
11.	Improved Fake Currency Detector using Integrated Transmission and Reflective Spectral Response	Murli Manohar Joshi, Ram Prakash Bajpai, Gautam Mitra, Harish Kumar Sardana, Hari Naryan Bhargaw, Saroj Batra	7.3.2005	PCT/IN2005/00072	PCT
12.	Improved Fake Currency Detector using Integrated Transmission and Reflective Spectral Response	Murli Manohar Joshi, Ram Prakash Bajpai, Gautam Mitra, Harish Kumar Sardana, Hari Naryan Bhargaw, Saroj Batra	8.3.2005	11/073585	US
13.	Improved Fake Currency Detector using Visual and Automated Integrated Reflective Spectral Response	Murli Manohar Joshi, Ram Prakash Bajpai, Gautam Mitra, Harish Kumar Sardana, Hari Naryan Bhargaw, Saroj Batra	7.3.2005	PCT/IN2005/000073	PCT
14.	Improved Fake Currency Detector using Visual and Automated Integrated Reflective Spectral Response	Murli Manohar Joshi, Ram Prakash Bajpai, Gautam Mitra, Harish Kumar Sardana, Hari Naryan Bhargaw, Saroj Batra	9.3.2005	11/074,755	US

Patent Applications Filed in India

S. No.	Title	Inventors	Date of Filing	Application No.
1.	DNA based Number System and Arithmetic	LM Bharadwaj, AK Shukla, Amol P Bhondekar, Rakesh Kumar, RP Bajpai	20.5.2004	0918DEL2004
2.	Intensity Modulated Fiber Optic Temperature Switching Immersion Probe	Nahar Singh, SC Jain, AK Aggarwal	13.8.2004	02371DELNP 2004
3.	A Blood Transfusion System	KD Chattopadhyay S Verma, P Raj, J Gupta	6.9.2004	02611DELNP 2004
4.	A Device Useful for Signal Transfer from Static Surface to	Surjit Singh Ahluwalia, Sunil Ratan Taneja,	29.9.2004	02931DELNP 2004

Patents & Publications

S. No.	Title	Inventors	Date of Filing	Application No.
	Rotating Surface & Vice Versa	Sanjeev Verma		
5.	A Ceramic Mixture having Negative Temperature Co-efficient, A Thermistor containing the Ceramic Mixture & a Process for Preparing Thereof	Madan Lal Singla, Baldev Raj , Vijay Rajaram Harchekar, RP Bajpai	29.9.2004	02934DELNP 2004
6.	Synthesis of Platinum and Palladium Quantum Well Size Nano-Particles	Madan Lal Singla, Mewa Singh, DVS Singh, Ram Kishore, Ram Prakash Bajpai	9.11.2004	03504DELNP 2004
7.	A Method of Forming a Rainbow Security Holograms	Sushil Kumar Kaura, Dharam Pal Chhachhia, Anil Kumar Aggarwal, Ram Prakash Bajpai	9.11.2004	03503DELNP 2004
8.	Microbial Decontaminator	Ghulam Nabi Qazi, Satish Chander Puri, Anupama Braroo, Vijeshwar Verma, Syed Riyaz Ul Hassan, Rejesh Anand, Lalit M Bhardwaj, Amol P Bhondekar, Ashwini Kumar, RP Bajpai	30.11.2004	*
9.	Improved Fake Currency Detector using Integrated Transmission and Reflective Spectral Response	Murli Manohar Joshi, Ram Prakash Bajpai Gautam Mitra, Harish Kumar Sardana, Hari Naryan Bhargaw, Saroj Batra	3.3.2005	*
10.	Improved Fake Currency Detector using Visual & Automated Integrated Reflective Spectral Response	Murli Manohar Joshi, Ram Prakash Bajpai, Gautam Mitra, Harish Kumar Sardana, Hari Naryan Bhargaw, Saroj Batra	3.3.2005	*
11.	An Energy Efficient Data Acquisition System and a Computer Controlled On-line Energy Monitoring System Incorporating the Same	RK Mohan Rao, Chenthamarai Selvam, Meenalochahni Chander, Krishna D Moorthy, GS Ayyappan	21.3.2005	*
12.	Laser based Apparatus for Projectile Velocity Measurement	RC Kalonia, G Mitra, A Kumar, BB Bahuguna, C Mohan, S Sharma, AK Sobti, M Singh, RK Verma, MK Gupta, RP Bajpai, VS Sethi	31.3.2005	0790DEL2005

* not available yet

PAPERS PUBLISHED IN JOURNALS

Sr. No.	Title	Journal	Author(s)
1.	Realization of holographic optics based interferometer for study of phase objects	Indian Journal of Pure & Applied Physics, Vol. 42(5), pp 326-333, 2004	AK Aggarwal, Sushil K Kaura, DP Chhachhia and AK Sharma
2.	Microbend resolution enhancing technique for fiber optic based sensing and monitoring of landslides	Experimental Techniques, Vol. 28(3), pp 37-42, 2004	NS Aulakh, JK Chhabra, Nahar Singh and Subhash C Jain
3.	VisiDAQ3.1 based optoelectronic system for the quantitative analysis of inorganic Phosphate-Phosphorous: absorption spectroscopy	Journal of Scientific & Industrial Research, Vol. 63(6), pp 509-511, 2004	PK Mahapatra, MS Walia, Laxmi Pandey, Mewa Singh, SC Jain and ML Singla
4.	A compact holographic optics based interferometer	Current Science, Vol. 87(2), pp 228-232, 2004	AK Aggarwal, Sushil K Kaura, DP Chhachhia and AK Sharma
5.	Holographic optics based interferometer for real-time testing of phase objects	Optics & Laser Technology, Vol. 36(10), pp 545-549, 2004	AK Aggarwal, Sushil K Kaura, DP Chhachhia and AK Sharma
6.	Microcontroller based oscillation monitoring system for the safety of railway vehicles with high storage capacity & real time warning facility	Journal of Scientific & Industrial Research Vol. 63(9), pp 752-757, 2004	SK Mittal, Sandeep Kalra, MA Shamshi and BK Sharma
7.	Development of portable metal oxide gas sensor for the detection of foul odour	Journal of Scientific and Industrial Research, Vol.63(10), pp 842-845, 2004	C Ghanshyam, Sunita Mishra, AK Sharma, N Ram, Satinder Singh, RP Bajpai & RK Bedi
8.	A simple, compact and cost-effective optical interferometer using a grating and holographic optics	Journal of Scientific and Industrial Research, Vol. 63 (12), pp 992-996, 2004	AK Sharma, Sushil K Kaura, R Kumar, DP Chhachhia & AK Aggarwal
9.	Formaldehyde concentration measuring system: an optoelectronic device	Journal of Scientific & Industrial Research, Vol. 63 (12), pp 989-991, 2004	ML Singla, MS Walia, Mewa Singh, PK Mahapatra, Laxmi Pandey, Shailja and SC Jain
10.	Technologies convergence in recent instrumentation for natural disaster monitoring and mitigation	IETE Technical Review, Vol. 2(4), pp 277-290, 2004	MA Shamshi
11.	IT for management of agricultural resources and development	IETE Technical Review, Vol.21(3), pp 219-227, 2004	VD Shivling and AK Ganju
12.	Design and characterization of a direct current glow discharge lamp for analytical applications	Analytica Chimica Acta, Vol. 525, pp 299-303, 2004	AK Dimri, AK Paul and RP Bajpai.
13.	Realization of an optical interferometer based on holographic	PRAMANA Journal of Physics, Vol. 63(5), pp 993- 1001, 2004	AK Aggarwal, Sushil K Kaura, DP Chhachhia

Papers Published in Journals

Sr. No.	Title	Journal	Author(s)
	optics for real-time testing of phase objects		and AK Sharma
14.	Interferometry based security hologram readable with an encoded key hologram	Indian Journal of Pure & Applied Physics, Vol. 42(11), pp 816-819, 2004	AK Aggarwal, Sushil K Kaura, AK Sharma and DP Chhachhia
15.	A robust interferometer based on holographic optics	Experimental Techniques , Vol. 29 (1), pp 21-24, 2005	AK Aggarwal, Sushil K Kaura, DP Chhachhia and AK Sharma
16.	Comparative study of water core in red delicious and golden delicious apples of Himachal Pradesh	Journal of Applied Horticulture, 7(1), pp 46-48, Jan-June 2005	ML Singla, SC Jain, Shweta Sharma and SK Angra
17.	Intrusion Detection System based on Speckle Pattern Analysis.	Experimental Techniques, 29(1) 25-31, 2005	A Dhall, JK Chhabra and NS Aulakh
18.	Fiber Bragg grating writing using phase mask technology	Journal of Scientific Industrial Research, Vol. 64 (2), pp 108-115, 2005	Nahar Singh, Subhash C Jain, AK Aggarwal and RP Bajpai
19.	Mechanically-created long period fiber gratings (LPFGs) as sensitive bend sensors	Optical Engineering , Vol. 44(3), pp 0344031-4, 2005	Nahar Singh, Subhash Jain, Vandana Mishra, GC Poddar, Ashu Kumar Bansal, VK Jindal and RP Bajpai
20.	Microcontroller (MCS-51) based optoelectronic system for the determination of metal and non-metal ions	Journal of Scientific & Industrial Research, Vol. 64(3), pp 181-184, 2005	MS Walia, SC Jain, PK Mahapatra, Mewa Singh and ML Singla
21.	1-Ethyl-3-(3-dimethylaminopropyl) carbodiimide interference with Lowry method	Analytical Biochemistry Vol. 336(1), pp 132-134, 2005	Rakesh Kumar, AK Shukla, Ellis Bagga, Sunita Kumari, RP Bajpai and LM Bharadwaj
22.	DNA and quantum based algorithms for VLSI circuits testing	Natural Computing, Vol. 4(1), pp 53-72, 2005	Amardeep Singh, LM Bharadwaj and Harpreet Singh

PAPERS PRESENTED IN CONFERENCES/SYMPOSIA

S. No.	Title of the Paper	Name of the Seminar/Conference	Venue	Author(s)
1.	Bio-nano devices for electronics applications	Elitex 2004-Exhibition-cum-Seminar (Organised by the Ministry of Information & Communication Technology)	Pragati Maidan, New Delhi	LM Bharadwaj
2.	Design & development of infrared technique based snow surface temperature measurement probe	Proceedings of International Symposium on "Snow Monitoring and Avalanches" (ISSMA-2004), April 12-16, 2004	SASE, Manali (HP)	SK Mittal, MA Shamshi, BK Sharma and RK Garg

Papers Presented in Conferences/Symposia

S. No.	Title of the Paper	Name of the Seminar/Conference	Venue	Author(s)
3.	PC architecture based snow data acquisition system with telemetry link	Proceedings of International Symposium on "Snow Monitoring & Avalanches" (ISSMA-2004), April 12-16, 2004	SASE, Manali (HP)	Satish Kumar, BK Sharma and MA Shamshi
4.	Weather & snow stations for avalanche warning	International Symposium on Snow Monitoring and Avalanches, April 12-16, 2004	SASE, Manali (HP)	Amit Dhall, JK Chhabra, Navneet Aulakh and Asha Kumar
5.	Simulation of fiber optic MEMS based pressure sensor	National Conference on Optoelectronics and MEMS Technologies, April 16-17, 2004	CSIO, Chandigarh	NS Aulakh, JK Chhabra, NS Mehla & SC Jain
6.	Simulation of fiber Bragg grating sensor	National Conference on Optoelectronics & MEMS Technologies, April 16-17, 2004	CSIO, Chandigarh	NS Aulakh, JK Chhabra, NS Mehla and SC Jain
7.	Loss resonance characteristics of different lengths of mechanically created long period gratings	National Conference on Optoelectronics & MEMS Technologies, April 16-17, 2004	CSIO, Chandigarh	Vandana Mishra, Ashu Kumar Bansal, GC Poddar, NS Aulakh, SC Jain, JK Chhabra, Nahar Singh & RP Bajpai
8.	Effect of bending on the transmission spectrum of a mechanically created long period fiber grating	National Conference on Optoelectronics & MEMS Technologies, April 16-17, 2004	CSIO, Chandigarh	Ashu Kumar Bansal, Vandana Mishra, GC Poddar, NS Aulakh, SC Jain, JK Chhabra, Nahar Singh & RP Bajpai
9.	Fiber optic point temperature sensor	National Conference on Optoelectronics & MEMS Technologies, April 16-17, 2004	CSIO, Chandigarh	GC Poddar, Ashu Kumar Bansal, Vandana Mishra, SC Jain, Nahar Singh & RP Bajpai
10.	Growth of nonlinear optoelectronic materials using MBE system	National Conference on Optoelectronics & MEMS Technologies, April 16-17, 2004	CSIO, Chandigarh	N Ram, C Ghanshyam, Sunita Mishra, Satinder Singh, Sanjeet Kumar, Srivastava, Dimple Garg & RP Bajpai
11.	Design and development of temperature controller for controlling the selectivity of H ₂ S gas sensor	National Conference on Optoelectronics & MEMS Technologies, April 16-17, 2004	CSIO, Chandigarh	C Ghanshyam, Rahul Tripathi, Sunita Mishra, N Ram, Satinder Singh, RP Bajpai and RK Bedi
12.	Design of high power pump source to safe laser for geo-scientific application	National Conference on Optoelectronics & MEMS Technologies April 16-17, 2004	CSIO, Chandigarh	PK Singh, SK Mittal, Manjeet Singh and BK Sharma

Papers Presented in Conferences/Symposia

S. No.	Title of the Paper	Name of the Seminar/Conference	Venue	Author(s)
13.	A new sensing device based on SnO ₂ - CuO/porous silicon heterojunction	National Conference on Advanced Materials and Technology, September 24-26, 2004	DAV College, Amritsar	Sunita Mishra, Deepthi Komalan, Mandeep Kaur, Sapinder Kaur, C Ghanshyam, N Ram & RP Bajpai
14.	Design of sensor components & electronic accessories for gas sensor applications	National Conference on Advanced Materials and Technology, September 24-26, 2004	DAV College, Amritsar	C Ghanshyam, Sunita Mishra, N Ram, Satinder Singh, RP Bajpai and RK Bedi
15.	Design and development of temperature controller circuit for foul odour gas sensor applications	National Conference on Advanced Materials and Technology, September 24-26, 2004	DAV College, Amritsar	C Ghanshyam, Harsimrat, Manbir, Rahul Tripathi, Sunita Mishra, N Ram, Satinder Singh, RP Bajpai and RK Bedi
16.	Study of the behavior of recent earthquakes in Hindukush region	National Seminar on Recent advances in Himalayan Geology with special reference to the NW Himalaya, organized by CAS in Geology, October 6-8, 2004	PU, Chandigarh	BK Sharma, VK Pandey, SK Mittal and Satish Kumar
17.	Fiber Bragg gratings: new sensors	Scientific & Technical National Seminar, 120-126, November 23-24, 2004	TBRL (DRDO), Ramgarh, Panchkula, Haryana	Ruchi Luthra, Ashu Kumar Bansal, Himani Singla, Palvinder Kaur, Vandana Mishra, GC Poddar, Subhash Chander Jain, Nahar Singh, AK Aggarwal and Pawan Kapur
18.	Optical fiber long period gratings for measurement of concentration & refractive index of liquids	Scientific & Technical National Seminar, 127-133, November 23-24, 2004	TBRL (DRDO), Ramgarh, Panchkula, Haryana	Palvinder Kaur, Vandana Mishra, Himani Singla, Ashu Kumar Bansal, Ruchi Luthra, GC Poddar, Subhash Chander Jain, Nahar Singh, AK Aggarwal and Pawan Kapur
19.	Importance of extrinsic Fabry-Perot interferometric sensor technology for defence instrumentation	Scientific & Technical National Seminar, 112-119, November 23-24, 2004	TBRL (DRDO), Ramgarh, Panchkula, Haryana	Gopal Chander Poddar, Subhash Chander Jain, Nahar Singh, Navneet Singh

Papers Presented in Conferences/Symposia

S. No.	Title of the Paper	Name of the Seminar/Conference	Venue	Author(s)
				Aulakh, Ashu Kumar Bansal, Vandana Mishra, Palvinder Kaur, Ruchi Luthra, Himani Singla, AK Aggarwal and Pawan Kapur
20.	Design consideration of a Long Range Oblique Photography (LOROP) cameras system	Scientific & Technical National Seminar, November 23-24, 2004	TBRL (DRDO), Ramgarh, Panchkula, Haryana	GS Singh, SV Rama Gopal and PK Jain
21.	Development of aspheric technology based high precision optics for strategic applications	Scientific & Technical National Seminar, November 23-24, 2004	TBRL (DRDO), Ramgarh, Panchkula, Haryana	SV Rama Gopal, GS Singh and PK Jain
22.	Efficiency of electronic techniques in the operation of mobile electromagnetic instruments for defence	Scientific & Technical National Seminar, November 23-24, 2004	TBRL (DRDO), Ramgarh, Panchkula, Haryana	NS Aulakh, JK Chhabra, GC Poddar, Subhash Chander Jain and Nahar Singh
23.	Bend sensitivity study of mechanically created long period gratings (LPGs)	Asia Pacific Microwave Conference, December 15-18, 2004	DUSC, New Delhi	Vandana Mishra, Subhash C Jain, Nahar Singh, GC Poddar, Ashu Kumar Bansal, Palvinder Kaur, VK Jindal & RP Bajpai
24.	An optical fiber pressure sensor for gases	Asia Pacific Microwave Conference, December 15-18, 2004	DUSC, New Delhi	Subhash C Jain, Nahar Singh, GC Poddar, Ashu Kumar Bansal, Vandana Mishra, Himani Singla, Ashish Khanduri and RP Bajpai
25.	Gas chromatography based explosive detector	International Conference on Instrumentation, December 19-21, 2004	Pune Institute of Engg. & Technology, Pune	AK Dimri, RR Dongaonkar, Veena Chaudhary, Ragbir Singh and Rama Nand
26.	Substrate design & issues for gas sensor applications	DAE Solid State Physics Symposium, December 26-30, 2004	GND University, Amritsar	C Ghanshyam, Isha Dhiman, Anand Pandey, Sunita Mishra, N Ram, Satinder Singh, RP Bajpai and RK Bedi

Papers Presented in Conferences/Symposia

S. No.	Title of the Paper	Name of the Seminar/Conference	Venue	Author(s)
27.	Development of precision aspheric lenses using optical grade plastic materials for indirect ophthalmoscopy	XXX Optical Society of India Symposium on Optics & Opto-Electronics, January 19-21, 2005	NPL, New Delhi	Rama Gopal V Sarepaka, GS Singh, Charanjeet Singh and PK Jain
28.	Development of aspheric lenses hand-held self-illuminated low vision reading aids using plastic	XXX Optical Society of India Symposium on Optics & Opto-Electronics, January 19-21, 2005	NPL, New Delhi	Ramagopal V Sarepaka, GS Singh, Charanjeet Singh & PK Jain
29.	Kinematics of four components electronically compensated zoom lenses	XXX Optical Society of India Symposium on Optics & Opto-Electronics, January 19-21, 2005	NPL, New Delhi	GS Singh and RP Bajpai
30.	Matching parametric study of copper substrate -during single point diamond turning for strategic applications	XXX Optical Society of India Symposium on Optics & Opto-Electronics, January 19-21, 2005	NPL, New Delhi	SV Ramagopal, KT Santosh Kumar, Charanjeet Singh and PK Jain
31.	Development of security holograms, digital & HOE based interferometry	XXX Optical Society of India Symposium on Optics and Opto-Electronics, January 19-21, 2005, (Plenary Lecture)	NPL, New Delhi	AK Aggarwal
32.	Encoded security holograms with concealed verification features	XXX Optical Society of India Symposium on Optics and Opto-Electronics, January 19-21, 2005	NPL, New Delhi	Sushil K Kaura, AK Sharma, DP Chhachhia and AK Aggarwal
33.	Measurement of refractive index and thickness of transparent objects by using holographic optical elements based interferometer	XXX Optical Society of India Symposium on Optics and Opto-Electronics, January 19-21, 2005	NPL, New Delhi	Amit K Sharma, Sushil K Kaura, DP Chhachhia, Raj Kumar and AK Aggarwal
34.	Mechanically induced long period grating (LPG) pair as concentration sensor	XXX Optical Society of India Symposium on Optics and Opto-Electronics, January 19-21, 2005	NPL, New Delhi	Subhash C Jain, Nahar Singh, Vandana Mishra, Ashu Kumar Bansal, GC Poddar, KD Chattopadhyya, AK Aggarwal and Pawan Kapur
35.	Synthesis of Nickel & Nickel oxide nano particle by wet chemical method	National Conference on Advances in Condensed Matter Physics, February 11-12, 2005	Thapar Institute of Engg. & Technology, Patiala	A Negi, ML Singla and Mewa Singh
36.	Colloidal Pd/Pt nano particle single step synthesis & characterization	National Conference on Advances in Condensed Matter Physics, February 11-12, 2005	Thapar Institute of Engg. & Technology, Patiala	S Kakkar, ML Singla

Patents & Publications

S. No.	Title of the Paper	Name of the Seminar/Conference	Venue	Author(s)
37.	Application of conducting polymer for the detection of flavour compound in edible oils	National Conference on Advances in Condensed Matter Physics, February 11-12, 2005	Thapar Institute of Engg. & Technology, Patiala	ML Singla, Mewa Singh, A Sharma PK Sansanswal
38.	Design and development of hydrogen sulphide detector	Chandigarh Symposium on Microelectronics, February 18-19, 2005	PU, Chandigarh	C Ghanshyam, Anand Pandey, Gurmeet S Rathore, Ankur Sharma, Manoj Sharma, Sunita Mishra, Satinder Singh, N Ram, RP Bajpai and RK Bedi
39.	Development of molecular beam epitaxy system and fabrication of photonic devices	Chandigarh Symposium on Microelectronics, February 18-19, 2005	PU, Chandigarh	N Ram, VP Giridhar, C Ghanshyam, Sunita Mishra, Satinder Singh, AK Sharma & RP Bajpai
40.	Role of deep level defects in enhancement of optoelectronic properties of GaAs based devices grown by MBE at low temperature	Chandigarh Symposium on Microelectronics, February 18-19, 2005	PU, Chandigarh	Dimple Garg, N Ram, C Ghanshyam, Sunita Mishra, Satinder Singh, Sanjeet Kumar, Ruchika, Harmeet Singh & RP Bajpai
41.	Fabrication and characterisation of GaAs/AlGaAs based photo detector using MBE system	Chandigarh Symposium on Microelectronics, February 18-19, 2005	PU, Chandigarh	Shipra Dudy, N Ram, C Ghanshyam, Sunita Mishra, Satinder Singh, Sanjeet Kumar, Ruchika, Harmeet Singh, Amarpreet Kaur & RP Bajpai
42.	Fabrication and characterization of GaAs/AlGaAs based laser diode using molecular beam epitaxy system	Chandigarh Symposium on Microelectronics, February 18-19, 2005	PU, Chandigarh	Babaljot Kaur, N Ram, C Ghanshyam, Sunita Mishra, Satinder Singh, Sanjeet Kumar, Ruchika, Harmeet Singh, Ramanjeet Kaur & RP Bajpai

8

जनशक्ति एवं
बजटीय आंकड़े

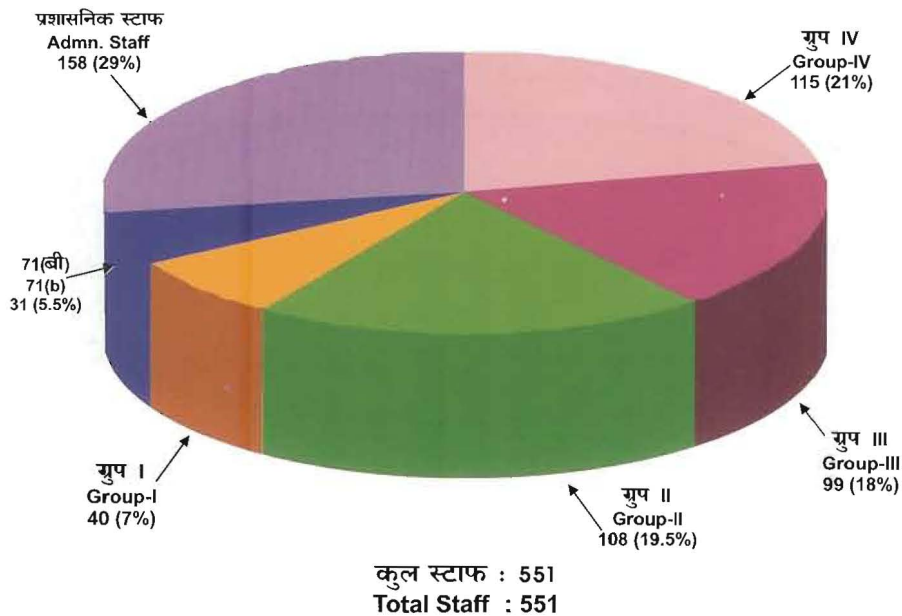
*Manpower &
Budgetary Statistics*



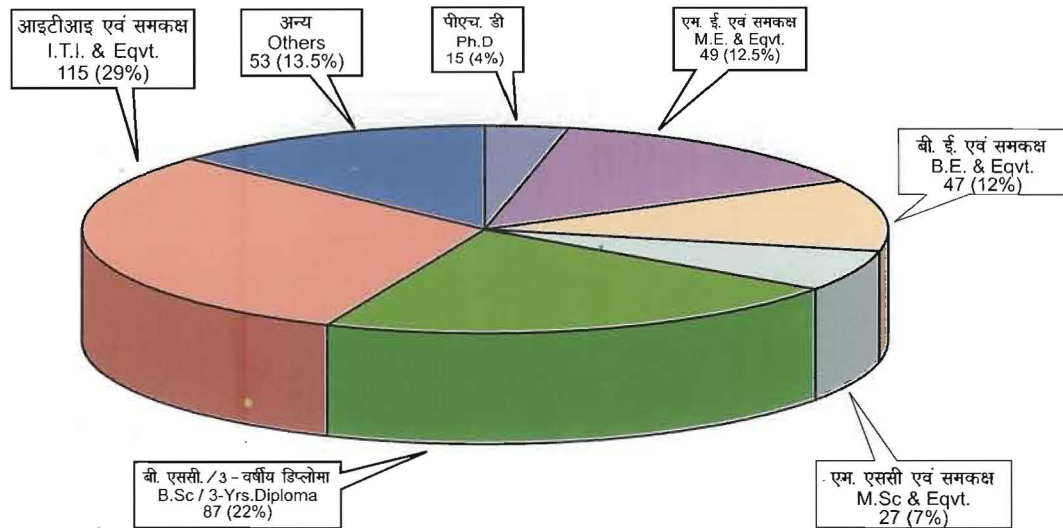
स्वीकृत पद संख्या एवम् स्टाफ की गुप/वर्गानुसार स्थिति
GROUP/CATEGORY-WISE SANCTIONED STRENGTH & STAFF POSITION
(As on 31st March, 2005)

S.No	Group/Category of Staf	Sanctioned Strength			Filled-up Posts		
		Regular	Isolated	Total	Regular	Isolated	Total
A : S&T Staff							
1.	Group-IV	(135+1) 136	---	136	115	---	115
2.	Group-III	160	---	160*	99	---	99*
3.	Bye-law 71(b)	--	---	--	31	---	31*
4.	Group-II	(120+2) 122	---	122	108	---	108
5.	Group-I	45	---	45	40	---	40
Total A :		463	---	463	393	---	393
B : Admn. Staff							
6.	Group-A	5	3	8	5	1	6
7.	Group-B (Gaz.)	10	1	11	10	1	11
8.	Group-B (N.G.)	45	1	46	42	2	44
9.	Group-C	44	9	53	37	7	44
10.	Group-D	62	9	71	45	8	53
Total B :		166	23	189	139	19	158
G.Total (A+B) :		629	23	652	532	19	551

कुल स्टाफ संख्या (31 मार्च, 2005 को)
Total Staff Strength (As on 31st March, 2005)

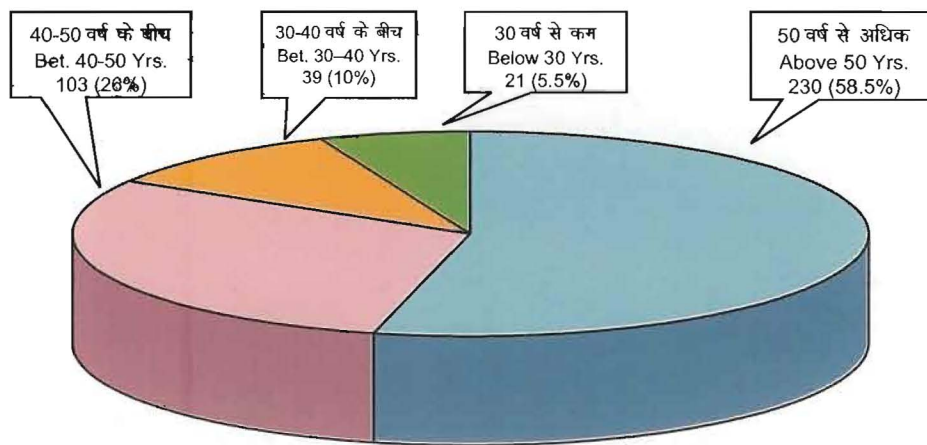


वैज्ञानिक एवं तकनीकी स्टाफ का शैक्षिक विवरण (31 मार्च, 2005 को)
Qualifications Profile of Scientific & Technical Staff (As on 31st March, 2005)



कुल वैज्ञानिक एवं तकनीकी स्टाफ : 393
 Total S&T Staff : 393

वैज्ञानिक एवं तकनीकी स्टाफ का आयु विवरण (31 मार्च, 2005 को)
Age Profile of Scientific & Technical Staff (As on 31st March, 2005)



कुल वैज्ञानिक एवं तकनीकी स्टाफ : 393
 Total S&T Staff : 393

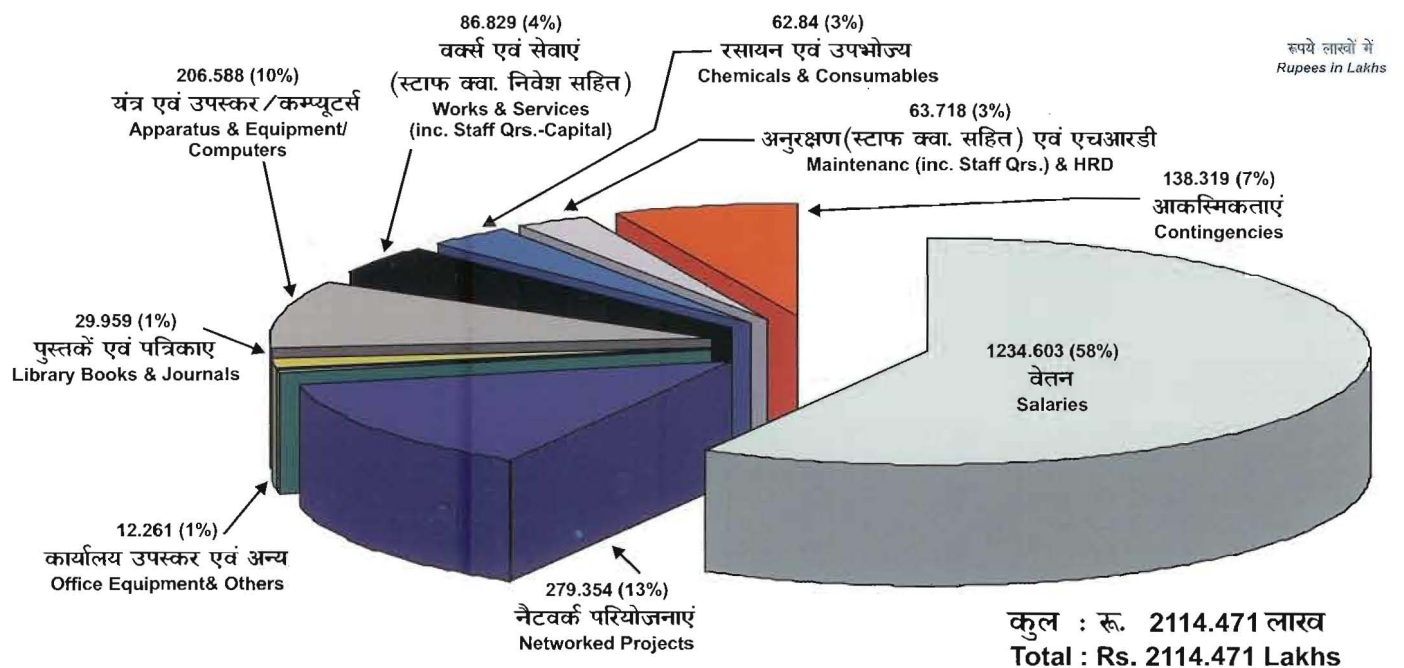
कुल भरे हुए पदों की वेतनमान के अनुसार स्थिति
PAY SCALE-WISE POSITION OF TOTAL FILLED-UP POSTS
(As on 31st March 2005)

S. No.	Designation	Pay Scale (in Rupees)	Scientific & Technical Staff					Administrative Staff			Total Staff
			IV	III	71(b)	II	I	Gaz.	Non-Gaz.	Gp-D	
1.	Director	18400-22400	1	--	--	--	--	--	--	--	1
2.	Scientist Gr.IV(7)	22400-24500	1	--	--	--	--	--	--	--	1
3.	Scientist Gr.IV(6)	18400-22400	4	--	--	--	--	--	--	--	4
4.	Scientist Gr.IV(5)	16400-20000	28	--	--	--	--	--	--	--	28
5.	Scientist Gr.IV(4)/ Technical Officer (TO) Gr.III(7) & Old(7)	14300-18300	34	3	1	--	--	--	--	--	38
6.	Scientist Gr.IV(3)/TO Gr.III(6) & Old(6)/CoA/CoF&A/CoS&P	12000-16500	5	17	3	--	--	3	--	--	28
7.	Scientist Gr.IV(2)/TO Gr.III(5) & Old(5)/Administrative Officer	10000-15200	12	25	21	--	--	2	--	--	60
8.	Scientist Gr.IV(1)/TO Gr.III(4) & Old(4)/Sr. Hindi Officer	8000-13500	30	24	5	--	--	1	--	--	60
9.	TO Gr.III(3) & Old(3)/Technician Gr.II(4)/Section Officer & Eqvt./Sr.Steno (ACP)	6500-10500	--	27	1	54	--	11	5	--	98
10.	Tech. Asstt. Gr.III(2)/Technician Gr.II(3)/Asstt. (G/F&A/S&P) Gd.I & Gd.II (ACP)/Sr. Steno/Jr.Steno (ACP)/Sr.Sec.Asstt.	5500-9000	--	1	--	46	--	--	42	--	89
11.	Jr.Hindi Translator/Tel.Operator	5000-8000	--	--	--	--	--	--	3	--	3
12.	Tech. Asstt. Gr.III(1)/Technician Gr.II(2)/Tech. Support Staff Gr.I(4)/Security Asstt.	4500-7000	--	2	--	6	20	--	--	--	28
13.	Assistant (G/F&A/S&P) Gd.II/ Jr.Steno	4000-6000	--	--	--	--	--	--	20	--	20
14.	Canteen Cook, Halwai, Coupon Clerk & Counter Clerk (ACP)	3200-4900	--	--	--	--	--	--	4	--	4
15.	Technician Gr.II(1)/Tech. Support Staff Gr.I(3)/Asstt. (G/F&A/S&P) Gd.III/Record Keeper/Staff Car Driver/Jr.Sec. Asstt./Security Guard (ACP)/ GH Asstt./Safaiwala (ACP)/ Bearer & Tea Maker (ACP)	3050-4590	--	--	--	2	18	--	14	8	42
16.	Tech. Support Staff Gr.I(2)/ Chair Canner Gd.II/Peon Gd.II/ Safaiwala Gd.II/Security Guard	2650-4000	--	--	--	--	2	--	--	23	25
17.	Canteen Wash Boy/Girl & Canteen Safaiwala (ACP)	2610-3540	--	--	--	--	--	--	--	2	2
18.	Tech. Support Staff Gr.I(1)/ Peon Gd.I/Farash Gd.I/GH Cook Gd.II/Chowkidar/Safaiwala Gd.I/Canteen Bearer	2550-3200	--	--	--	--	--	--	--	20	20
	Total Staff:		115	99	31	108	40	17	88	53	551

स्टाफ की क्षेत्रवार तैनाती (31 मार्च, 2005 को)
Area-wise Deployment of Staff (As on 31st March 2005)

Area	Group IV	Group III	Bye-law 71(b)	Group II	Group I	Admn. Staff	Total
Director's Secretariat	1	—	1	1	—	4	7
Agro & Geo-Scientific Instrumentation	18	16	—	2	1	1	38
Medical Instrumentation & Intelligent Prosthetic Devices for Disabled (incl. PTID, BDG & Library)	16	8	4	9	6	3	46
Cockpit Instrumentation & Opto-Mechanical Systems	21	19	10	41	3	2	96
Fiber/Laser Optics based Instrumentation (incl. ISTC)	13	22	6	11	2	6	60
Analytical Instruments & MEMS	11	8	4	5	2	2	32
Advanced Materials based Transducers	11	2	—	—	1	2	16
S&M Divn./Centres, Chandigarh/Delhi/Jaipur/Chennai	23	13	5	16	4	6	67
Engineering Services (Civil/Electrical/Refrigeration)	1	8	1	17	6	4	37
Administration	—	—	—	4	3	49	56
Finance & Accounts	—	—	—	—	1	20	21
Stores & Purchase	—	—	—	—	3	15	18
Auxiliary Services (Clinical Centre, Horticulture, Security, Guest House & Canteen)	—	3	—	2	8	44	57
Total Staff	115	99	31	108	40	158	551

वास्तविक व्यय (सीएसआइआर फंड एवं लैब रिज़र्व) : 2004-05
Actual Expenditure (CSIR Funds & Lab. Reserve) : 2004-05



वर्ष 2004 - 05 में वास्तविक व्यय
ACTUAL EXPENDITURE FOR THE YEAR 2004-05

(Rs. in lakhs)

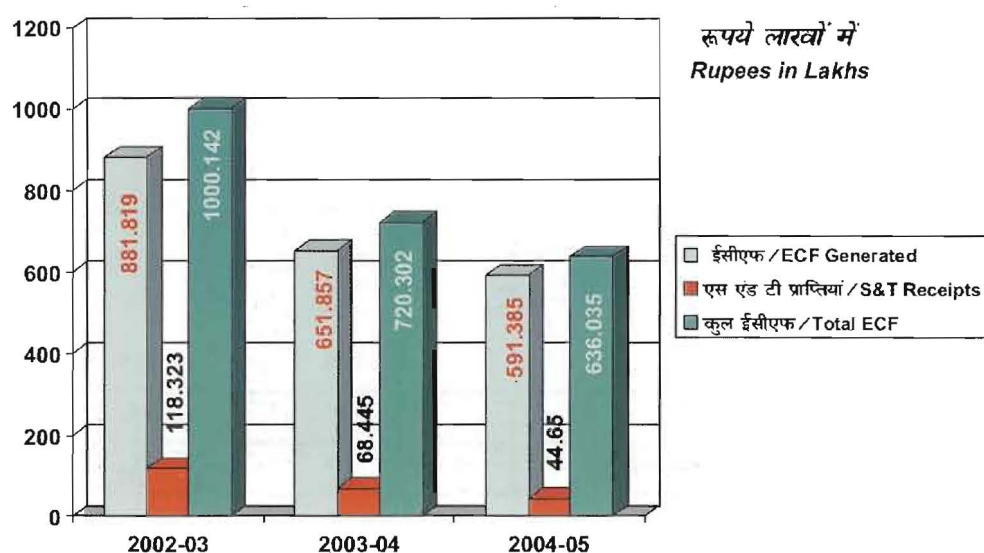
Head of Account	Source of Expenditure		
	CSIR Funds	Lab Reserve	Total
RECURRING			
Pay of Officers	444.454	—	444.454
Pay of Establishment	187.810	—	187.810
Dearness Pay	280.618	—	280.618
Allowances	321.592	0.129	321.721
Contingencies	125.000	13.319	138.319
Maintenance	41.958	21.055	63.014
Chemicals & Consumables	48.568	14.272	62.840
HRD	0.704	—	0.704
Total Recurring	1450.705	48.775	1499.480
CAPITAL			
Works & Services	(-)0.007	24.789	24.782
Apparatus & Equipment (including Computer Equipment/Major Computer Software)	199.997	6.591	206.588
Workshop Machinery	—	—	—
Office Equipment	1.999	1.362	3.361
Furniture & Fittings	1.994	2.294	4.288
Library Books & Journals	29.959	—	29.959
Vehicles	—	4.044	4.044
Tools & Plants	0.446	0.122	0.568
Models & Exhibits	—	—	—
Staff Quarters Exp. (Capital)	60.890	1.157	62.047
Total Capital	295.278	40.359	335.637
TOTAL (RECURRING+CAPITAL)	1745.983	89.134	1835.117
Networked Projects	279.354	—	279.354
GRAND TOTAL	2025.337	89.134	2114.471

वर्ष 2002-03 से 2004-05 के दौरान कुल बाह्य नकद प्रवाह
TOTAL EXTERNAL CASH FLOW (ECF) GENERATED DURING
THE YEARS 2002-03 TO 2004-05

(Rs. in lakhs)

Actual Receipt	2002-03	2003-04	2004-05
i) ECF Generated under Sponsored/ Grant-in-Aid/Collaborative/ Consultancy Projects	881.819	651.857	591.385
ii) S&T Receipts (under Royalty/Premia, Job Work, Testing & Analytical Charges and Other Technical Services)	118.323	68.445	44.650
Total ECF :	1000.142	720.302	636.035

कुल बाह्य नकद प्रवाह (ईसीएफ) : 2002-03 से 2004-05
Total External Cash Flow (ECF)
[2002-03 to 2004-05]

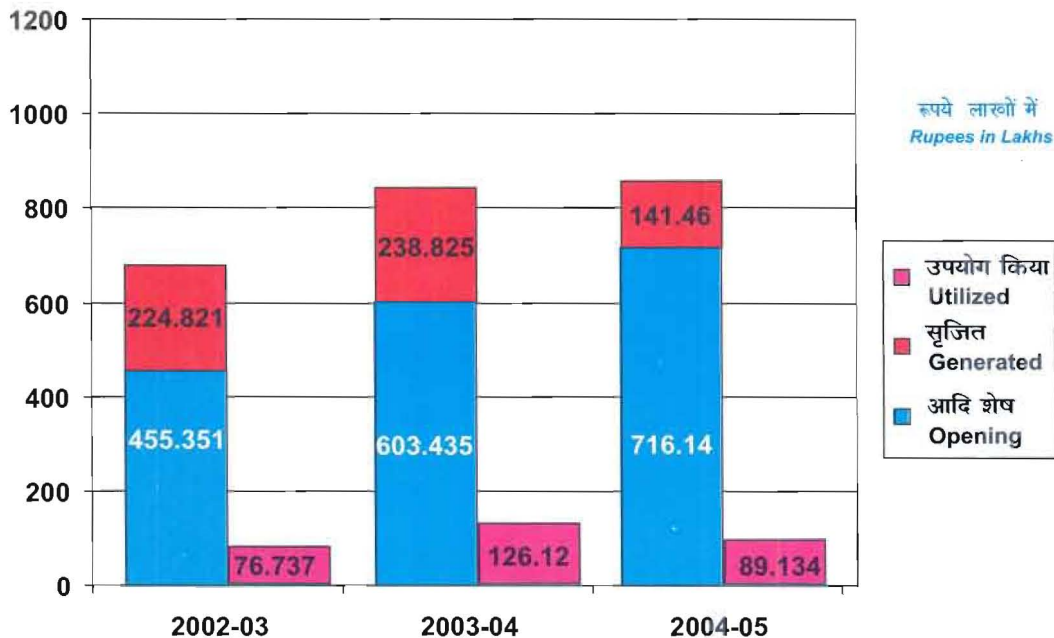


वर्ष 2002-03 से 2004-05 के दौरान लैब रिज़र्व की स्थिति
POSITION OF LAB RESERVE DURING THE YEARS 2002-03 TO 2004-05

(Rs. in lakhs)

Year	Opening Balance	Generated	Total	Utilised
2002-03	455.351	224.821	680.172	76.737
2003-04	603.435	238.825	842.260	126.120
2004-05	716.140	141.460	857.600	89.134

लैब रिज़र्व की तुलनात्मक स्थिति : 2002-03 से 2004-05
Comparative Position of Lab Reserve : 2002-03 to 2004-05





Abbreviations

A/D	Analog/Digital	DST	Department of Science and Technology
ADA	Aeronautical Development Agency (Bangalore)	DTA	Differential Thermal Analysis
ADE	Aeronautical Development Establishment (Bangalore)	DUSC	Delhi University South Campus
AERB	Atomic Energy Regulatory Board (Mumbai)	ECF	External Cash Flow
AFM	Atomic Force Microscopy	ECG	Electro Cardio Gram
AJT	Advanced Jet Trainer	ECS	Environment Control System
AMC	Annual Maintenance Contract	EDP	Entrepreneurial Development Programme
AMU	Aligarh Muslim University (Aligarh)	EFPI	Extrinsic Fabry Perot Interferometric
ARMREB	Armament Research Board	EISCO	Electronic Instrument Company (Ambala)
ASIC	Application Specific Integrated Circuit	ELCINA	Electronic Component Industries Associates
BARC	Bhabha Atomic Research Centre	EMI	Electro Magnetic Interference
BEL	Bharat Electronics Limited	EMS	Energy Management System
BHEL	Bharat Heavy Electricals Limited	EMSI	Electron Microscope Society of India
BOD	Bio-Oxygen Demand	ENT	Ear, Nose and Throat
CAT	Combat Aircraft Trainer	EPR	Electron Paramagnetic Resonance
CBRI	Central Building Research Institute (Roorkee)	ESCO	Energy Saving Companies
CCD	Charged Coupled Device	FBG	Fiber Bragg Grating
CCU	Cardiac Care Unit	FCCS	Future Challenges in Chemical Science
CDRI	Central Drug Research Institute (Lucknow)	FFT	Fast Fourier Transform
CEERI	Central Electronics Engineering Research Institute (Pilani)	FICCI	Federation on Indian Chamber of Commerce & Industry
CFRI	Central Fuel Research Institute (Dhanbad)	FIDS	Fiber Intrusion Detection System
CFTRI	Central Food Technological Research Institute (Mysore)	FITC	Fluorescein Isothiocynata
CIMAP	Central Institute of Medicinal and Aromatic Plants (Lucknow)	FLIR	Forward Looking Infrared Radar
CMERI	Central Mechanical Engineering Research Institute (Durgapur)	FOV	Field of View
CMRI	Central Mining Research Institute (Dhanbad)	FPGA	Field Programmable Gate Arrays
CoH	Coefficient of Haze	GDP	Gross Domestic Product
CPYLS	CSIR Program on Youth for Leadership in Science	GMCH	Govt. Medical College & Hospital (Chandigarh)
CRRRI	Central Road Research Institute (New Delhi)	GTZ	Gesellschaft Fur Technische Zusammenarbeit
CSIR	Council of Scientific & Industrial Research (New Delhi)	HAL	Hindustan Aeronautics Limited
CSV	Cumulative Senivariogram Technique	HJT	Hindustan Jet Trainer
DAAD	Deutscher Akademischer Austausch Dienst	HOE	Holographic Optical Element
DAE	Department of Atomic Energy	HRDC	Human Resource Development Centre
DCGA	Digital Cereal/Grain Analyzer	HSS	High Speed Steel
DG sets	Diesel Generating sets	HT/LT	High Tension / Low Tension
DIC	Differential Interference Contact	HUD	Head Up Display
DIT	Department of Information Technology	HUDWAC	Head Up Display and Weapon Aiming Computer
DNA	Deoxyribose Nucleic Acid	IARI	Indian Agricultural Research Institute (New Delhi)
DRDO	Defence Research & Development Organisation	ICP	Inductively Coupled Plasma
DSC	Differential Scanning Calorimeter	IETE	The Institution of Electronics and Telecommunication Engineers (New Delhi)
DSP	Digital Signal Processing	IGEEP	Indo-German Energy Efficiency and Environment Program
		IHBT	Institute of Himalayan Bioresource Technology (Palampur)
		IICB	Indian Institute of Chemical Biology (Kolkata)
		IIT	Indian Institute of Technology
		IMT	Institute of Microbial Technology (Chandigarh)

Abbreviations

IPMD	Intellectual Property Management Division	PMT	Panacea Medical Technology
IQUA	Index of the Quality of Air	PU	Panjab University (Chandigarh)
IR	Infra Red	PV1	Product Version
ISAMPE	Indian Society for Advancement of Materials	QA	Quality Assurance
ISSMA	International Symposium on Snow Monitoring and Avalanche	R&D	Research & Development
ISTC	Indo-Swiss Training Centre (CSIO, Chandigarh)	RC	Research Council
ISTM	Institute of Secretarial, Training and Management	RDSO	Research Design Standards Organisation
ITEC	Indian Technical and Economic Corporation	RF/DC	Radio Frequency/Direct Current
ITRC	Industrial Toxicology Research Centre (Lucknow)	RIICO	Rajasthan State Industrial Development & Investment Corporation Ltd. (Jaipur)
LCA	Light Combat Aircraft	RMRS	Regional Muga Research Station
LCD	Liquid Crystal Display	RRL	Regional Research Laboratory
LED	Light Emitting Diode	RTC	Real Time Clock
LOROP	Long Range Oblique Photography	S&M	Service & Maintenance
LPG	Long Period Grating	S&T	Science & Technology
LPT	Low Power Transmitter	SAA	Small Arms Ammunitions
LSP	Limited Series Production	SAMEER	Society of Applied Microwave Engineering & Research
M&V	Measurement & Verification	SASE	Snow Avalanche Study Establishment
MBPS	Megabits Per Second	SASO	Social Awareness Service Organisation
MDP	Management Programme Development	SBS	Stand By Sight
MEMS	Micro Electro-Mechanical System	SCAAP	Special Commonwealth African Assistance Plan
MERADO	Mechanical Engineering Research and Development Organisation (Ludhiana)	SCL	Semiconductor Complex Limited (Mohali)
MFM	Magnetic force Microscopy	SDMH	Santokba Durlabhji Memorial Hospital (Jaipur)
MF-UFCP	Multi Functional Up Frame Control Panel	SEL	Sound Exposure Level
MML	Minimum Message Length	SEPM	Scanning Electrical Potential Microscopy
MNE	Micro and Nano Engineering	SOF	Safety of Flight Tests
MoU	Memorandum of Understanding	SOOP	Southern Ocean Oceanography and Paleoclimatology (Goa)
MPL	Manali Petrochemicals Limited	SOP	Standard Of Preparation
NAL	National Aerospace Laboratories (Bangalore)	SPDT	Single Point Diamond Turning
NCC	National Cadet Corps	SPI	Serial Peripheral Interface
NGRI	National Geophysical Research Institute (Hyderabad)	SPL	Sound Pressure Level
NITTTR	National Institute of Technical Teachers Training and Research	SPM	Scanning Probe Microscope
NPL	National Physical Laboratory (New Delhi)	STAI	Sugar Technologists Association of India
NPSM	National Program on Smart Materials	STM	Scanning Tunneling Microscopy
NSG	National Security Guards (Manesar, Gurgaon)	SWOT	Strength, Weaknesses, Opportunities, and Threats
NSPTS	National Seminar on Physics and Technology of Sensors	TBRL	Terminal Ballistics Research Laboratory (Chandigarh)
NTC	Negative Temperature Coefficient	TGA	Thermo Gravimetric Analysis
OSHA	Occupational Safety Health Administration	THD	Total Harmonic Distortion
PAU	Punjab Agricultural University (Ludhiana)	TMOP & M	Technology Mission on Oilseeds, Pulses & Maize
PEAT	Portable Energy Audit Tools	TNPL	Tamilnadu Newsprint and Papers Limited
PGIMER	Post Graduate Institute of Medical Education and Research	TQM	Total Quality Management
PM	Particulate Matter	TWAD	Tamilnadu Water Supply and Drainage Board
		UFCP	Up Frame Control Panel
		UV	Ultra Violet
		VLSI	Very Large Scale Integration

वार्षिक प्रतिवेदन 2004 – 05

विषय सूची

प्रमुख आयोजन एवं क्रियाकलाप

- राष्ट्रीय प्रौद्योगिकी दिवस – 2004
- श्री कपिल सिब्बल, माननीय विज्ञान एवं प्रौद्योगिकी और महासागर विकास मंत्री तथा उपाध्यक्ष, सीएसआइआर का सीएसआइओ, चण्डीगढ़ का दौरा
- अनुसंधान परिषद की 29वीं बैठक
- समझौता ज्ञापन
- सीएसआइआर स्थापना दिवस तथा हिंदी पखवाड़ा
- डॉ. पवन कपूर द्वारा संगठन निदेशक के पद पर कार्यभार ग्रहण
- सीएसआइओ स्थापना दिवस
- सतर्कता जागरूकता सप्ताह
- विज्ञान में युवा नेतृत्व पर सीएसआइआर कार्यक्रम
- जयपुर में सीएसआइओ-उद्योग सम्मेलन
- राष्ट्रीय विज्ञान दिवस – 2005

मानव संसाधन विकास

- इण्डो-स्विस प्रशिक्षण केन्द्र
- आयोजित कार्यशालाएं
- सम्मान एवं पुरस्कार

जन शक्ति विवरण

- स्टाफ सूची
- पदोन्नतियां
- नव-नियुक्तियां एवं स्थानांतरण पर कार्यभार ग्रहण
- सेवानिवृत्तियां
- सीएसआइओ से स्थानांतरण
- त्यागपत्र
- देहावसान



राष्ट्रीय प्रौद्योगिकी दिवस – 2004

राष्ट्रीय प्रौद्योगिकी दिवस के अवसर पर 11 मई, 2004 को संगठन की प्रयोगशालाएं आम जनता के लिए खुली रखी गईं। बड़ी संख्या में विभिन्न स्कूलों, कॉलेजों और विश्वविद्यालयों के विद्यार्थियों सहित अन्य लोगों ने संगठन की विभिन्न प्रयोगशालाओं को देखा। उन्होंने वैज्ञानिकों से बातचीत की और वैज्ञानिकों द्वारा उन्हें संगठन में विकसित प्रौद्योगिकियों की जानकारी दी गई। इस अवसर पर श्री एस. आर. तनेजा, वैज्ञानिक 'जी', "सीएसआइओ ने 'प्रौद्योगिकी, विपणन तथा नेतृत्व' विषय पर व्याख्यान दिया।

श्री कपिल सिब्बल, माननीय विज्ञान एवं प्रौद्योगिकी और महासागर विकास मंत्री तथा उपाध्यक्ष, सीएसआइआर का सीएसआइओ, चण्डीगढ़ का दौरा

श्री कपिल सिब्बल, माननीय विज्ञान एवं प्रौद्योगिकी और महासागर विकास मंत्री तथा उपाध्यक्ष, सीएसआइआर दिनांक 30 अगस्त, 2004 को सीएसआइओ के दौरे पर चण्डीगढ़ आए। सीएसआइओ स्टाफ को संबोधित करते हुए उन्होंने कहा कि चण्डीगढ़ को नैनो-प्रौद्योगिकी के केन्द्र के रूप में विकसित किया जाएगा, बिल्कुल वैसे ही जैसा कि बंगलूर सूचना प्रौद्योगिकी का केन्द्र है। उन्होंने कहा कि प्रौद्योगिकी की हमारे जीवन में गहरी पैठ है, फिर भी हम इसके महत्त्व को नहीं समझते। उन्होंने वैज्ञानिकों का आह्वान किया कि विज्ञान और तकनीक को सामान्य जनोन्मुख बनाया जाए। उन्होंने सार्वजनिक और निजी क्षेत्र के बीच भागीदारी की आवश्यकता पर बल दिया, जिसके बिना हम विज्ञान और प्रौद्योगिकी के क्षेत्र में कहीं भी नहीं पहुंच पाएंगे। केंद्रीय मंत्री ने वैज्ञानिक रूझान के प्रसार और विद्यार्थियों में उत्सुकता के तत्त्व को विकसित करने की भी आवश्यकता जताई।

संगठन की विभिन्न प्रयोगशालाओं का दौरा कर उन्होंने संगठन के वैज्ञानिकों द्वारा किए जा रहे अनुसंधान कार्य की अत्यधिक प्रशंसा की। उन्होंने वैज्ञानिकों को आश्वासन दिया कि विज्ञान और प्रौद्योगिकी पर वार्षिक व्यय को जीडीपी के 0.7 प्रतिशत से बढ़ाकर लगभग 2.00 प्रतिशत करने को वे उच्च प्राथमिकता देंगे। बाद में

संगठन में मीडिया के प्रतिनिधियों से बात करते हुए उन्होंने प्रौद्योगिकी विकास में तेजी लाने के लिए आर एंड डी संस्थानों एवं विश्वविद्यालयों द्वारा एकजुट होकर कार्य करने के सुझाव पर सहमति व्यक्त की। इससे पूर्व संगठन निदेशक डॉ. राम प्रकाश बाजपेयी ने मंत्री जी का स्वागत करते हुए संगठन में नैनोप्रौद्योगिकी और चिकित्सा इलैक्ट्रॉनिक्स के क्षेत्र में किए जा रहे नवाचारों पर प्रकाश डाला।

संगठन की अनुसंधान परिषद की 29वीं बैठक

सीएसआइओ की अनुसंधान परिषद की 29वीं बैठक 3 अगस्त, 2004 को सीएसआइओ, चण्डीगढ़ में आयोजित की गई। इसकी अध्यक्षता युनिवर्सिटी ऑफ हैदराबाद, हैदराबाद के वाइस चांसलर डॉ. कोटा हरिनारायण ने की। बैठक के प्रारंभ में संगठन के तत्कालीन निदेशक डॉ. राम प्रकाश बाजपेयी ने अनुसंधान परिषद के अध्यक्ष एवं सदस्यों का स्वागत किया। उन्होंने पुरानी अनुसंधान परिषद के अध्यक्ष एवं सदस्यों की उनके द्वारा संगठन निदेशक और स्टाफ को प्रदान किए गए मार्गदर्शन के लिए प्रशंसा की। तदुपरांत उन्होंने सेवा एवं अनुरक्षण केन्द्रों एवं इण्डो-स्विस प्रशिक्षण केन्द्र (आइएसटीसी) सहित संगठन की गत कुछ वर्षों की महत्त्वपूर्ण उपलब्धियों और क्रियाकलापों पर प्रकाश डाला।

श्री एस. आर. तनेजा, वैज्ञानिक 'जी', सीएसआइओ ने अपने प्रस्तुतिकरण में संगठन के गत तीन वर्षों के क्रियाकलापों एवं उपलब्धियों पर प्रकाश डाला। उन्होंने संगठन की सामरिक स्थिति यथा विज्ञान (सीएसआइओ का रोड-मैप) तथा चल रहे अनुसंधान एवं विकास कार्यों के संबंध में बताया। अपने प्रस्तुतिकरण में श्री तनेजा ने सीएसआइओ का एसडब्ल्यूओटी विश्लेषण, चल रहे सीएसआइआर नैटवर्क कार्यक्रम तथा कार्यनिष्पादन मूल्यांकन बोर्ड की संस्तुतियों पर की गई कार्रवाई के संबंध में भी सूचना प्रदान की।

अनुसंधान परिषद के अध्यक्ष डॉ. कोटा हरिनारायण ने कहा कि गत कुछ वर्षों में सीएसआइओ ने उल्लेखनीय उन्नति की है, जो कि संगठन में चल रही अनुसंधान एवं विकास परियोजनाओं की कुल संख्या एवं उनके मूल्य, ईसीएफ, फाइल किए गए पेटेंट आवेदन, हस्तारित

प्रौद्योगिकियों की संख्या आदि से प्रमाणित होता है। अध्यक्ष महोदय ने बड़ी संख्या में उत्पाद और प्रौद्योगिकियां विकसित किए जाने के लिए भी सीएसआइओ की प्रशंसा की।

अनुसंधान परिषद ने डॉ. राम प्रकाश बाजपेयी को विज्ञान एवं प्रौद्योगिकी परिषद, विज्ञान एवं प्रौद्योगिकी विभाग, उत्तर प्रदेश सरकार से उन्हें वर्ष 2003-04 के लिए प्राप्त "विज्ञान गौरव सम्मान" के लिए उन्हें बधाई दी। अनुसंधान परिषद के सदस्यों ने श्री एन. एस. मेहला, श्री एस. सी. जैन, डॉ. ए. के. अग्रवाल तथा डॉ. राम प्रकाश बाजपेयी को स्मार्ट टेक्नोलॉजी के विकास हेतु के. सूर्यनारायण राव स्मृति पुरस्कार – 2004 प्राप्त करने पर बधाई दी।

समझौता ज्ञापन

सीएसआइओ ने सोसाइटील मिशन की दिशा में प्रयास करते हुए 7 अगस्त, 2004 को राजकीय चिकित्सा कालेज एवं अस्पताल (जीएमसीएच) के साथ शिक्षा के क्षेत्र में एक संयुक्त सहयोगी कार्यक्रम, विशेष रूप से बीएस. सी. (ऑप्टिकल तकनीकें) कोर्स चलाने के लिए एक समझौता ज्ञापन पर हस्ताक्षर किए। इसके अर्न्तगत सीएसआइओ द्वारा चश्में बनाने और संबंधित प्रकाशिकी के क्षेत्र में जीएमसीएच के बीएस. सी. (ऑप्टिकल तकनीकें) कोर्स के विद्यार्थियों को अध्यापन/प्रशिक्षण संकाय/सुविधाएं प्रदान की जाएंगी। इसके अतिरिक्त दोनों संस्थान मूल ढांचा सुविधाओं का भी पारस्परिक आदान-प्रदान करेंगे।

एक अन्य समझौता ज्ञापन सुपर प्रिंसीपल बॉल-एन्ड शैफ्ट एंड कप्स के लिए संभाव्यता अध्ययन हेतु सीएसआइओ और भाभा एटोमिक रिसर्च सेंटर (बार्क), ट्रॉम्बे के बीच हुआ। बार्क आणविक ऊर्जा विभाग, भारत सरकार के अधीन एक प्रमुख बहुमुखी संगठन है, जो परमाणु ऊर्जा उत्पादन, विज्ञान को उन्नत बनाने, उद्योगों, स्वास्थ्य, कृषि के क्षेत्र में रेडियो आइसोटोप के प्रयोग के लिए ज्ञान और तकनीकों को विकसित करने के उद्देश्य से

अनुसंधान कार्य कर रहा है। यहां विज्ञान एवं प्रौद्योगिकी के प्रमुख क्षेत्रों में भी अनुसंधान कार्य हो रहा है। संगठन के पास चूंकि सुपर प्रिंसीपल संघटकों के विकास के लिए आवश्यक उच्च परिशुद्धता वाले सिंगल प्वाइंट डायमंड टनिंग (एसपीडीटी) एवं प्रिंसीपल मैट्रोलॉजी में विशेषज्ञता उपलब्ध है, इस प्रकार से यह बार्क के प्रयासों में सहयोग कर सकता है।

सीएसआइआर स्थापना दिवस समारोह

केन्द्रीय वैज्ञानिक उपकरण संगठन, चण्डीगढ़ में दिनांक 26 सितम्बर, 2004 को प्रतिवर्ष की भांति सीएसआइआर स्थापना दिवस आयोजित किया गया। इस दिन संगठन की सभी प्रयोगशालाएं आम जनता के लिए खुली रखी गईं। विभिन्न स्कूलों, इंजीनियरिंग कॉलेजों और विश्वविद्यालयों से विद्यार्थियों सहित बड़ी संख्या में आम जनता ने संगठन की प्रयोगशालाओं को देखा। इससे उन्हें संगठन में विकसित किए जा रहे उपकरणों के विषय में जानने और वैज्ञानिकों के साथ विचार-विमर्श का अनुपम अवसर प्राप्त हुआ।

प्रो. ओ. पी. बाजपेयी, निदेशक, राष्ट्रीय तकनीकी शिक्षक प्रशिक्षण एवं अनुसंधान संस्थान, चण्डीगढ़ ने "Hyper Spectral Imaging" विषय पर व्याख्यान दिया। प्रो. बाजपेयी ने अपने संबोधन में कहा कि हाइपर स्पैक्ट्रल इमेजिंग, जो कि पदार्थ का 'स्पैक्ट्रल सिगनेचर' होता है, सैटेलाइट के प्रयोग से अन्वेषण में अत्यंत आधुनिक तकनीक है। उन्होंने बताया कि हाइपर स्पैक्ट्रल इमेजिंग का मैडिकल डायग्नोसिस, टार्गेट डिटेक्शन एंड रैकोगनिशन, कैमिकल डिटेक्शन एंड क्लाउड ट्रैकिंग, अर्थ रिसोर्सिज एंड रिमोट सेंसिंग में व्यापक अनुप्रयोग है। उन्होंने अपने व्याख्यान में मल्टीस्पैक्ट्रल एवं हाइपर स्पैक्ट्रल इमेजिंग से जुड़े तकनीकी मुद्दों तथा अनुप्रयोगों के बारे में भी विस्तृत जानकारी दी।

सीएसआइओ के उन स्टाफ सदस्यों को, जो

सीएसआइआर में 25 वर्ष की निरन्तर सेवा पूरी कर चुके हैं और गत वर्ष 26 सितम्बर से इस वर्ष 31 अगस्त तक सेवानिवृत्त हुए स्टाफ कर्मियों को स्मृति चिह्न और शॉल प्रदान कर सम्मानित किया गया। कार्यक्रम सीएसआइआर स्थापना दिवस और हिन्दी पखवाड़ा समारोह के अन्तर्गत आयोजित विभिन्न प्रतियोगिताओं के विजेताओं को पुरस्कार वितरण के साथ समाप्त हुआ।

हिन्दी पखवाड़ा आयोजित

संगठन में प्रतिवर्ष की भाँति इस वर्ष भी 14 से 26 सितंबर, 2004 को हिन्दी पखवाड़े का आयोजन किया गया। इसके अन्तर्गत हिन्दी टंकण, श्रुतलेख, वैज्ञानिक एवं तकनीकी विषयों पर पेपर रीडिंग, आशु भाषण, निबंध लेखन, हिन्दी टिप्पण एवं प्रारूपण एवं भाषण प्रतियोगिता सहित कुल सात प्रतियोगिताओं का आयोजन किया गया। इनमें से भाषण प्रतियोगिता इण्डो-स्विस प्रशिक्षण केन्द्र के प्रशिक्षुओं के लिए आयोजित की गई थी। प्रतियोगिताओं के विजेताओं को रुपये 1,000/-, रुपये 600/- एवं रुपये 300/- के क्रमशः प्रथम, द्वितीय एवं तृतीय पुरस्कार प्रदान किए गए। इसके अतिरिक्त संगठन निदेशक द्वारा विशेष रूप से अनुमोदित हिन्दी के कार्य में वृद्धि करने तथा अपना अधिकाधिक कार्य हिन्दी में करने की एक प्रोत्साहन योजना के अन्तर्गत श्री बी एस विरदी, वैज्ञानिक एवं श्री जसवंत राय, अनुभाग अधिकारी को रुपये पाँच सौ के पुरस्कार से पुरस्कृत किया गया।

पखवाड़े के दौरान राजकीय चिकित्सा कॉलेज अस्पताल के अस्थिरोग विभाग के प्रमुख डॉ. राज बहादुर द्वारा "अस्थि रोग" विषय पर एक व्याख्यान का आयोजन किया गया। इस व्याख्यान की संगठन स्टाफ में बहुत अधिक सराहना हुई एवं भविष्य में भी स्वास्थ्य एवं चिकित्सा विषयों पर विशेषज्ञों के हिन्दी में और अधिक व्याख्यान आयोजित करवाने का प्रस्ताव रखा गया। हिन्दी पखवाड़े का समापन दिनांक 26 सितंबर, 2004 को सीएसआइआर

स्थापना दिवस के अवसर पर मुख्य अतिथि प्रो. ओ. पी. बाजपेयी, निदेशक, राष्ट्रीय तकनीकी शिक्षक प्रशिक्षण एवं अनुसंधान संस्थान, चण्डीगढ़ द्वारा पुरस्कार वितरण से हुआ।

डॉ. पवन कपूर ने निदेशक, सीएसआइओ के पद पर कार्यभार ग्रहण किया

डॉ. पवन कपूर (जन्म 9 दिसम्बर 1950, अमृतसर) ने 15 अक्टूबर, 2004 को केन्द्रीय वैज्ञानिक उपकरण संगठन (सी.एस.आइ.ओ) चण्डीगढ़ के नए निदेशक के रूप में कार्यभार संभाला। इन्होंने वर्ष 1969 में कोलकाता विश्वविद्यालय से फिज़िक्स ऑनर्स में बीएस.सी. तथा इसके बाद क्रमशः 1972, 1974, एवं 1978 में कोलकाता विश्वविद्यालय के यूनिवर्सिटी कालेज ऑफ साइंस एंड टेक्नोलॉजी से बी.टैक., एम. टैक. एवं पीएच.डी. (बायोमैडिकल इंजीनियरिंग) की डिग्रियां प्राप्त कीं। डॉ. कपूर ने केन्द्रीय इलेक्ट्रॉनिकी अभियांत्रिकी अनुसंधान संस्थान (सीरी), पिलानी से 1975 में वैज्ञानिक 'बी' के रूप में अपना कैरियर प्रारम्भ किया, जहां 13 अक्टूबर, 2004 को ऑफिस छोड़ने के समय ये वैज्ञानिक 'जी' और डिप्टी जूनियर यूनिट के प्रभारी थे।

सीरी में अपने कार्यकाल के दौरान इन्होंने विभिन्न कृषि आधारित उद्योगों के लिए इलेक्ट्रॉनिक प्रोसेस कन्ट्रोल एवं इन्स्ट्रुमेंटेशन सिस्टम्स संबंधी अनेक परियोजनाओं पर कार्य किया। इन्होंने हाल में टी रिसर्च एसोसिएशन, जोरहाट में पूर्ण रूप से स्वचालित मॉडेल टी फैक्ट्री (एमटीएफ) के लिए काम किया। डॉ. कपूर ने सीरी, पिलानी में माइक्रोप्रोसेसर डिवलेपमेन्ट लेबोरेट्री फॉर सिस्टम डिवलेपमेन्ट, सैन्सर विकास एवं आभासी यंत्रिकरण एवं नियंत्रक डिजाइन अवसरचना के लिए अभिलक्षण सुविधाएं भी स्थापित कीं। डॉ. कपूर सी.एस.आइ.ओ द्वारा समन्वित 'सामाजिक उद्देश्यों के लिए इलेक्ट्रॉनिकी' पर सी.एस.आइ.आर द्वारा संचालित परियोजना पर जारी रहे।

सीरी की ओर से नोडल अधिकारी रहे।

डॉ. कपूर ने विदेशों में कुछ अग्रणी संस्थानों में भी कार्य किया, जिनमें प्रमुख हैं: स्वचालित नियंत्रण सिस्टम पर टेक्नीकल यूनिवर्सिटी, म्यूनिख, जर्मनी (1979-80); शर्करा किस्टलीकरण प्रक्रिया का स्वचालन, यूनिवर्सिटी ऑफ क्वींसलैंड, ब्रिसबेन, ऑस्ट्रेलिया (1986); एडवांस्ड कंट्रोल एल्गोरिद्म पर हंगेरियन अकादमी ऑफ साइन्सेस, बुडा पेस्ट (1981), सॉफ्ट कम्प्यूटिंग टेकनीक्स पर जर्मन राष्ट्रीय सूचना प्रौद्योगिकी अनुसंधान संस्थान, बॉन (1997)। इन्होंने व्यापार विकास के लिए ब्राजील, मॉरिशस, यू.के., यू.एस.ए. का भी दौरा किया।

डॉ. कपूर ने 40 अनुसंधान लेख प्रकाशित किए, विभिन्न संगोष्ठियों में 50 तकनीकी पत्र प्रस्तुत किए, 10 पेटेंट (सील्ड 4, प्रोसेस में 6) दर्ज किए, 6 मुख्य उत्पाद, 8 स्पिन-ऑफ उत्पाद, 25 अनुसंधान परिणाम रिपोर्टें, 5 पुस्तकों के अध्याय तथा 50 से अधिक छात्रों का उनके शोध प्रबन्धों के लिए मार्गदर्शन किया। शर्करा एवं चाय यंत्रीकरण की प्रौद्योगिकी उद्योगों को हस्तान्तरित की गई तथा इनके आधार पर लगातार उत्पादन हो रहा है। डॉ. कपूर को अनेक पुरस्कार प्राप्त हुए, जिनमें से मुख्य हैं : एफआइसीसीआई (1979), ईएलसीआईएनए, ईटीई (1989), सी.एस.आइ.आर टैक्नोलॉजी शील्ड (1992), एसटीएआई शुगर कप (1993), सातवां हरीराम तोशनीवाल स्वर्ण पदक— आइईटीई (1995), एसटीएआई— रजत पदक (1997, 1998), नोएल डीर स्वर्ण पदक (2004)।

डॉ. कपूर ने विभिन्न विज्ञान सोसायटियों जैसे इंस्टीट्यूशन ऑफ इलेक्ट्रॉनिक एंड टेलीकम्यूनिकेशन इंजीनियर्स, शुगर इन्डस्ट्री टेक्नोलॉजिस्ट्स (यूएसए), इंटरनेशनल सोसायटी ऑफ शुगरकेन टेक्नोलॉजिस्ट्स (ब्राजील), शुगर टेक्नोलॉजिस्ट एसोसिएशन ऑफ इण्डिया, इण्डो-फ्रेंच टेक्नीकल एसोसिएशन, इण्डियन

फिजिक्स एसोसिएशन तथा टीआरए-इंजीनियरिंग कमेटी, ब्यूरो ऑफ इण्डियन स्टैंडर्ड्स शुगर कमेटी के सदस्य के रूप में भी कार्य किया। उनकी रुचि के मुख्य क्षेत्र हैं: इण्टेलीजेन्ट इन्स्ट्रूमेन्टेशन, प्रोसेस आटोमेशन एवं गुणवत्ता के परिमाणन के लिए सॉफ्ट-कम्प्यूटिंग तकनीकें।

सीएसआइओ स्थापना दिवस का आयोजन

संगठन द्वारा 30 अक्टूबर, 2004 को अपना 45वां स्थापना दिवस मनाया गया। प्रो. सुरेन्द्र प्रसाद, उपनिदेशक, आइआइटी, दिल्ली इस अवसर पर मुख्य अतिथि थे।

प्रो. प्रसाद ने 'Perspectives in Signal Processing' विषयक अपने व्याख्यान में सिगनल प्रोसेसिंग तकनीकों एवं सम्प्रेषण, मनोरंजन, उपकरण विन्यास, चिकित्सा एवं सुरक्षा के क्षेत्रों में उनके प्रयोगों के विभिन्न पक्षों पर प्रकाश डाला। उन्होंने अनेक उदाहरण देते हुए इस प्रौद्योगिकी से सामान्य आदमी को हुए लाभों की चर्चा की। उन्होंने भविष्य में इसके होने वाले उपयोगों की भी जानकारी दी।

इससे पूर्व संगठन निदेशक डॉ. पवन कपूर ने मुख्य अतिथि का स्वागत करते हुए सीएसआइओ स्थापना दिवस के महत्त्व पर प्रकाश डाला। संगठन की सफलताओं का उल्लेख करते हुए उन्होंने कहा कि वर्तमान वर्ष सफलताओं एवं उपलब्धियों का वर्ष रहा है, क्योंकि इस वर्ष विभिन्न क्षेत्रों की अनेक प्रौद्योगिकियां उद्योगों को हस्तान्तरित की गई हैं।

मुख्य अतिथि ने इस अवसर पर संगठन की वर्ष 2003-04 की वार्षिक रिपोर्ट भी जारी की। इसके अतिरिक्त हरियाणा विद्यालय शिक्षा बोर्ड के अनुसूचित जातियों के दो विद्यार्थियों को विज्ञान विषयों में अधिकतम अंक प्राप्त करने के लिए रु 3000-3000 की छात्रवृत्ति भी प्रदान की गई।

सतर्कता सप्ताह का आयोजन

वैज्ञानिक एवं औद्योगिक अनुसंधान परिषद् के प्रमुख

सतर्कता अधिकारी के माध्यम से प्राप्त केन्द्रीय सतर्कता आयोग के निदेशों के अनुसार केन्द्रीय वैज्ञानिक उपकरण संगठन में 1-6 नवम्बर, 2004 को सतर्कता जागरूकता सप्ताह का आयोजन किया गया। सप्ताह का प्रारम्भ शपथ ग्रहण समारोह से हुआ, जिसके अन्तर्गत 1 नवम्बर, 2004 को संगठन निदेशक द्वारा स्टाफ को शपथ दिलवाई गई। इसी ही दिन संगठन के तीन अधिकारियों द्वारा विभिन्न विषयों पर व्याख्यान का आयोजन भी किया गया। श्री बासुदेव प्रसाद, वैज्ञानिक 'एफ' ने "आर एण्ड डी में भ्रष्टाचार" के प्रति जागरूकता, श्री ए के मित्तल, वरिष्ठ भंडार एवं क्रय अधिकारी ने "भण्डार एवं क्रय मामलों में भ्रष्टाचार के प्रति जागरूकता" एवं श्री एस सी जुनेजा, वित्त एवं लेखा अधिकारी ने "वित्तीय मामलों में भ्रष्टाचार के प्रति जागरूकता" विषयों पर व्याख्यान दिए।

सप्ताह के दौरान 2 नवम्बर, 2004 को संगठन स्टाफ के बच्चों के लिए "भ्रष्टाचार अभिशाप है" विषय पर पोस्टर मेकिंग प्रतियोगिता आयोजित की गई।

इसी क्रम में 5 नवम्बर, 2004 को श्री मुकेश चतुर्वेदी, उपनिदेशक, सचिवीय प्रशिक्षण एवं प्रबन्धन संस्थान (आइएसटीएम), नई दिल्ली द्वारा व्याख्यान का आयोजन किया गया। उन्होंने केन्द्रीय सिविल सेवाएं (आचार) नियमावली विषय पर व्याख्यान दिया।

पोस्टर मेकिंग प्रतियोगिता के विजेताओं को संगठन के कार्यकारी निदेशक द्वारा पुरस्कृत किया गया।

विज्ञान में युवा नेतृत्व पर सीएसआइआर कार्यक्रम (सीपीवाईएलएस)

विज्ञान में युवा नेतृत्व पर सीएसआइआर कार्यक्रम (सीपीवाईएलएस) संगठन में 6 दिसंबर, 2004 को आयोजित किया गया। प्रो. एस. सी. दत्ता राय, प्रोफेसर एमैरिटस, आइआइटी, दिल्ली ने कार्यक्रम का उद्घाटन करने के बाद प्रतिभागियों को संबोधित करते हुए कहा कि शिक्षा के क्षेत्र में इंजीनियरिंग ही सब-कुछ नहीं है, कई अन्य ऐसे लाभदायी विकल्प भी उपलब्ध हैं जिन्हें कैरियर के रूप में चुना जा सकता है और इनमें से एक है

विज्ञान। छात्रों को सलाह देते हुए उन्होंने उन्हें दिल व आत्मा से अध्ययन करने ; आगामी शिक्षा, अध्यापन तथा/अथवा अनुसंधान में विज्ञान विषय को चुनने के लिए प्रेरित किया। उन्होंने प्रतिभागियों का आह्वान किया कि वे देश में रहकर राष्ट्र के विकास के लिए कार्य करें।

डॉ. पवन कपूर, निदेशक, सीएसआइओ ने, इससे पूर्व अतिथियों का स्वागत करते हुए विज्ञान को कैरियर के रूप में अपनाने पर बल दिया। उन्होंने कहा कि विज्ञान के चयन से न केवल आत्मसंतोष मिलता है, अपितु स्व-विकास एवं मानव समाज की सेवा करने के भी असीम अवसर प्राप्त होते हैं। उन्होंने कहा कि वर्तमान युग में विविध विज्ञान विषयों के बीच की दूरियां कम होती जा रही हैं तथा विज्ञान वैश्विक स्तर पर होने वाला कार्य बन गया है। डॉ. कपूर ने सीएसआइओ द्वारा ग्लोरी एलर्ट सिस्टम से नैनोटेक्नोलॉजी तक किए जा रहे विविध कार्यों की संक्षिप्त जानकारी दी तथा विश्व प्रतिस्पर्धा का सामना करने के लिए कमर कसने पर बल दिया।

छात्रों को संगठन में उनके दो दिनों के आवास के दौरान अनुसंधान एवं विकास कार्यस्थानों से परिचित करवाने तथा विभिन्न वैज्ञानिक उपकरण, जिनके बारे में उन्होंने केवल पढ़ा है, दिखाने के लिए उन्हें सीएसआइओ की विभिन्न प्रयोगशालाओं का दौरा करवाया गया। इस कार्यक्रम से विद्यार्थियों को प्रयोगशालाओं में शोधकर्ताओं से निकट संपर्क का अवसर प्राप्त हुआ, उन्हें प्रयोगशालाओं की कार्य पद्धति के मौलिक नियमों की जानकारी देने के दृष्टिगत विशेष प्रबंध भी गए।

प्रतिभागी विद्यार्थियों के लिए एक मल्टी-मीडिया विज्ञान प्रश्नोत्तरी भी आयोजित की गई। उनमें वैज्ञानिक प्रतिभा का विकास करने एवं प्रेरित करने के लिए संगठन के वैज्ञानिकों द्वारा कुछ लोकप्रिय विज्ञान व्याख्यानों की व्यवस्था भी की गई थी।

यह युवा व मेधावी छात्रों को विज्ञान विषयों के प्रति आकर्षित करने के लिए सीएसआइआर का एक मिशन कार्यक्रम है तथा देश भर में आयोजित किया जाता है। दो-दिवसीय इस कार्यक्रम में हरियाणा

राज्य के 70 छात्रों ने भाग लिया।

जयपुर में सीएसआइओ-उद्योग सम्मेलन

राजस्थान में कृषि आधारित उपकरण विन्यास हेतु वैज्ञानिक उद्योग को बढ़ावा देने के लिए 10 फरवरी, 2005 को राजस्थान राज्य औद्योगिक विकास एवं निवेश निगम लिमिटेड (रीको), के साथ संयुक्त रूप से सीएसआइओ उद्योग सम्मेलन का आयोजन किया गया। इस सम्मेलन में सीएसआइओ द्वारा कृषि आधारित उद्योगों हेतु विकसित की गई प्रौद्योगिकियों को प्रदर्शित किया गया। समस्त प्रतिभागियों ने इनमें गहरी रुचि दिखाई और उपकरणों के संबंध में संगठन के वैज्ञानिकों के साथ चर्चा की। प्रदर्शनी में संगठन में विकसित स्वर्ण विश्लेषक और ऐतिहासिक महत्त्व के आभूषणों और स्मारकों का त्रि-आयामी होलोग्राफिक प्रदर्शन प्रमुख आकर्षण थे। डॉ. राकेश हूजा, आइएएस, अध्यक्ष एवं प्रबंध निदेशक, रीको इस अवसर पर मुख्य अतिथि थे। उन्होंने घोषणा की कि सीएसआइओ के सहयोग से रीको राजस्थान में कृषि आधारित परीक्षण प्रयोगशालाएं स्थापित करेगा। प्रारम्भ में ऐसी 3 प्रयोगशालाएं कोटा, जोधपुर एवं श्री गंगानगर में स्थापित की जाएंगी। इस परियोजना पर लगभग 1.50 करोड़ रुपये की लागत आएगी। डॉ. पवन कपूर, निदेशक सीएसआइओ ने अपने संबोधन में सीएसआइओ की प्रमुख उपलब्धियों और मुख्यतः कृषि आधारित प्रौद्योगिकियों पर प्रकाश डाला। डॉ. कपूर ने उद्योगों के व्यावसायीकरण के लिए सफलतापूर्वक हस्तांतरित की जा चुकी विभिन्न प्रौद्योगिकियों की भी चर्चा की।

राष्ट्रीय विज्ञान दिवस

केन्द्रीय वैज्ञानिक उपकरण संगठन में दिनांक 28 फरवरी, 2005 को राष्ट्रीय विज्ञान दिवस का आयोजन किया गया। इस दिन ओपन-डे अन्तर्गत संगठन की प्रयोगशालाएं प्रातः 10.00 बजे से दोपहर 1.00 बजे तक आम जनता के लिए खुली रखी गईं। विभिन्न स्कूलों, कॉलेजों और विश्वविद्यालय के

विद्यार्थियों सहित आम जनता ने संगठन की विभिन्न प्रयोगशालाओं को देखा और वैज्ञानिकों से उनके द्वारा किए जा रहे अनुसंधान कार्यों पर विचार-विमर्श किया। उन्हें संगठन में विकसित की जा रही प्रौद्योगिकियों के संबंध में जानकारी दी गई।

बाद दोपहर प्रो० एम एल मुंजाल, अध्यक्ष, मैकेनिकल विज्ञान प्रभाग, भारतीय विज्ञान संस्थान, बंगलौर ने "DESIGNING FOR QUIETNESS" विषय पर व्याख्यान दिया। उन्होंने विभिन्न प्रकार के उपकरणों के लिए शोर नियंत्रण उपायों पर प्रकाश डाला और कहा कि शोर के क्षेत्र में भी अनेक क्षेत्रों के समान सावधानी उपचार से बेहतर होती है। उन्होंने बताया कि निर्माण प्रक्रिया में आवाज़ रहित प्रौद्योगिकी का प्रयोग करना निर्माण उपरान्त शोर नियंत्रण के उपाय करने की तुलना में अत्यधिक लागत प्रभावी होता है।

इससे पूर्व संगठन निदेशक डॉ. पवन कपूर ने मुख्य अतिथि का स्वागत करते हुए राष्ट्रीय विज्ञान दिवस के महत्त्व पर प्रकाश डाला और कहा कि वैज्ञानिक ढंग से कार्य करना जीवन के प्रत्येक क्षेत्र में आवश्यक होता है। उन्होंने कहा कि इस वर्ष जबकि यूएन द्वारा वर्ष 2005 को इंटरनेशनल इयर ऑफ फिजिक्स घोषित किया गया है और विश्वभर में लगभग 30 देश आइंस्टाइन की थ्योरी ऑफ रिलेटिविटी की 100वीं जयंती मना रहे हैं, राष्ट्रीय विज्ञान दिवस जैसे आयोजन का महत्त्व और भी बढ़ जाता है। उन्होंने सीएसआइओ की भविष्य की योजनाओं पर प्रकाश डाला और CHANGE की अपने शब्दों में परिभाषा देते हुए, जिसमें C से तात्पर्य Core Competence, H से Higher Knowledge, A से Adaptation, N से Networking, G से Globally competitive और E से Excellence है, उन्होंने संगठन स्टाफ का आह्वान किया कि वे सीएसआइओ को नई ऊंचाइयों पर ले जाने के लिए और इसे उपकरण विन्यास नीति और उपकरण विन्यास के क्षेत्र में मानव संसाधन विकास में सर्वोच्च निकाय बनाने के लिए नवीन उत्साह से कार्य करें।

इण्डो-स्विस प्रशिक्षण केन्द्र (आइएसटीसी)

सीएसआइओ, चण्डीगढ़ का इण्डो स्विस प्रशिक्षण (आइएसटीसी) केन्द्र देश में तकनीकी जनशक्ति के प्रशिक्षण में अपनी महत्त्वपूर्ण भूमिका निर्वाह करता आ रहा है। इसकी स्थापना वर्ष 1963 में स्विस फाउंडेशन ऑफ टैक्निकल असिस्टेंस, स्विट्ज़रलैंड के सहयोग से की गई थी। इस प्रशिक्षण केन्द्र का मुख्य उद्देश्य इंजीनियर/डिज़ाइनर तथा कुशल कर्मियों के बीच का अन्तर समाप्त करने के लिए ठोस प्रयोगात्मक पृष्ठभूमि वाले युवा तकनीकी कर्मी तैयार करना है। इस प्रशिक्षण केन्द्र में निम्नलिखित तीन कोर्सों के माध्यम से उच्च श्रेणी का तकनीकी प्रशिक्षण प्रदान किया जाता है :

- उपकरण प्रौद्योगिकी में 3 - वर्षीय डिप्लोमा कोर्स
- मैकट्रॉनिक्स एवं इंडस्ट्रियल ऑटोमेशन में 4 - वर्षीय उच्च डिप्लोमा
- डाई एवं मोल्ड निर्माण में 4 - वर्षीय उच्च डिप्लोमा

प्रशिक्षण विधि

प्रशिक्षण कार्यक्रम का लक्ष्य थ्योरी तथा व्यावहारिक ज्ञान के संयोजन से उच्च स्तर की दक्षता का विकास करना है। शैक्षिक भ्रमण तथा औद्योगिक दौरो से प्रशिक्षणार्थी औद्योगिक तथा अनुसंधान एवं विकास प्रयोगशालाओं की वास्तविक कार्य प्रणाली एवं वातावरण से अवगत होते हैं। परियोजना रिपोर्ट लेखन, विविध संगोष्ठियों का आयोजन, समूह चर्चा तथा व्याख्यान इसमें महत्त्वपूर्ण भूमिका निभाते हैं।

स्विस कार्य पद्धति ने ऐसी कार्य संस्कृति का विकास किया है, जिसमें सदाचरण, समयबद्धता, स्वच्छता, अच्छे रहन-सहन, आज्ञा पालन, निष्ठा तथा श्रम के महत्त्व को अत्यंत महत्त्वपूर्ण स्थान दिया गया है।

आइएसटीसी का 39वां दीक्षांत समारोह

“आइएसटीसी को सम्पूर्ण विश्व और विशेष रूप से उद्योगों के सन्दर्भ में Innovative Scientific Technological Commitment के रूप में व्यक्त करना सर्वथा उपयुक्त होगा,” ये शब्द डॉ. ए. के. चावला, उपकुलपति, कुरुक्षेत्र विश्वविद्यालय, कुरुक्षेत्र ने सीएसआइओ के इण्डो-स्विस प्रशिक्षण केन्द्र के 39वें

दीक्षान्त समारोह पर अपने विचार व्यक्त करते हुए कहे। दीक्षान्त समारोह दिनांक 30 जुलाई, 2004 को आयोजित किया गया। उन्होंने आशा व्यक्त की कि संस्थान तकनीकी योग्यता एवं नेतृत्व क्षमता वाले व्यवसायी प्रदान करने के अपने संकल्प को जारी रखेगा। आइएसटीसी की उपलब्धियों पर चर्चा करते हुए डॉ. चावला ने उद्योगों को निरन्तर परिवर्तित होती आवश्यकता के अनुरूप उच्च क्षमतापूर्ण तकनीकी मानव शक्ति के विकास के केन्द्र के प्रयास की प्रशंसा की। उन्होंने विद्यार्थियों का आह्वान किया कि वे भौतिकता और उच्च कामनाओं की दौड़ में अपनी संस्कृति और नैतिक मूल्यों को न भूलें।

इससे पूर्व तत्कालीन संगठन निदेशक डॉ. आर. पी. बाजपेयी ने मुख्यातिथि का स्वागत करते हुए आइएसटीसी के कार्यकलापों पर प्रकाश डाला। डॉ. आर. पी. बाजपेयी ने सीएसआइओ के द्वारा नवीन क्षेत्रों और विशेष रूप से जैव और नैनो प्रौद्योगिकी के क्षेत्र में किए जा रहे पहलुओं पर संक्षेप में चर्चा की। उन्होंने प्रैस टूल्स के निर्माण, महत्त्वपूर्ण संघटकों के विकास और उद्योगों के कर्मचारियों के लिए समय-समय पर लघु अवधि के कोर्स आयोजित करके उद्योगों को आइएसटीसी द्वारा प्रदान की जा रही सहायता की प्रशंसा की।

आइएसटीसी के प्राचार्य श्री एच. एस. गुप्ता ने प्रशिक्षण केन्द्र की वार्षिक रिपोर्ट प्रस्तुत करते हुए समारोह में उपस्थित जनसमूह को सगर्व अवगत करवाया कि इस वर्ष उत्तीर्ण हुए प्रशिक्षुओं में से 90% से अधिक को विभिन्न विख्यात उद्योगों में नौकरियां मिल गई हैं और इनमें से अधिकतर को प्रशिक्षण अवधि के दौरान रूपये 12,000/- प्रतिमाह वेतन प्राप्त होगा। बाकी प्रशिक्षुओं को रोजगार दिलवाने के प्रयास किए जा रहे हैं। श्री गुप्ता ने आगे कहा कि केन्द्र से अब तक 2200 से अधिक विद्यार्थी प्रशिक्षण प्राप्त कर चुके हैं।

इसके बाद डॉ. बाजपेयी ने इस वर्ष उत्तीर्ण हुए प्रशिक्षुओं को डिप्लोमा और पोस्ट-डिप्लोमा प्रदान किए, जबकि मुख्य अतिथि डॉ. ए के चावला ने विभिन्न क्षेत्रों में श्रेष्ठ प्रदर्शन करने वाले प्रशिक्षुओं को पुरस्कार और पदक प्रदान किए। इस वर्ष कुल 66 विद्यार्थी उत्तीर्ण हुए। विभिन्न क्षेत्रों में स्वर्ण एवं रजत पदक प्राप्त करने वाले विद्यार्थियों का विवरण

निम्नानुसार हैं :

उपकरण प्रौद्योगिकी में डिप्लोमा

उत्तीर्ण प्रशिक्षु	:	31
निदेशक स्वर्ण पदक	:	मनदीप कुमार
प्राचार्य रजत पदक	:	तीर्थ अर्जुन बहामन्या

मैकाट्रॉनिक्स और औद्योगिक आटोमेशन में एडवांस डिप्लोमा

उत्तीर्ण प्रशिक्षु	:	15
निदेशक स्वर्ण पदक	:	अमन अत्रेजा
प्राचार्य रजत पदक	:	मिस्ती

डाई और मोल्ड मेकिंग में एडवांस डिप्लोमा

उत्तीर्ण प्रशिक्षु	:	20
निदेशक स्वर्ण पदक	:	वरुण शर्मा
प्राचार्य रजत पदक	:	जतिन्दर सिंह

दीक्षान्त समारोह की पूर्व संध्या पर आयोजित समारोह में संगठन निदेशक ने केन्द्र में वर्षभर में आयोजित किए गए विभिन्न खेल मुकाबलों के विजेताओं को पुरस्कृत किया। सुमन कुमार प्रसाद को वर्ष का श्रेष्ठ खिलाड़ी घोषित किया गया।

कार्यक्रम डॉ. आर. के. जैन के द्वारा औपचारिक धन्यवाद प्रस्ताव से सम्पन्न हुआ। उल्लेखनीय है कि इण्डो-स्विस प्रशिक्षण केन्द्र के नाम से लोकप्रिय आइएसटीसी की स्थापना स्विस फाउंडेशन फॉर टैक्निकल अस्सिस्टेंस, स्विट्ज़रलैण्ड के सहयोग से वर्ष 1963 में की गई थी।

रक्तदान शिविर

इण्डो स्विस प्रशिक्षण केन्द्र सामाजिक विकास के कार्यों में भी सदैव तत्पर रहा है। आइएसटीसी स्टाफ तथा प्रशिक्षणार्थी स्वैच्छिक रूप से रक्तदान शिविरों में भाग लेते हैं। इस संबंध में केन्द्र द्वारा वर्ष में दो रक्तदान शिविर लगाए गए। पहला रक्तदान शिविर जून, 2004 में लगाया गया तथा इसे भारतीय स्टेट बैंक द्वारा प्रायोजित किया गया। इस शिविर में 120 छात्रों एवं स्टाफ सदस्यों ने रक्त दान किया। दूसरा रक्तदान शिविर स्वयं आइएसटीसी द्वारा दिसंबर, 2004 में में लगाया गया,

जिसमें 130 प्रशिक्षणार्थियों ने भाग लिया। इस अवसर पर पीजीआई, चण्डीगढ़ ने श्री एम. पी. सिंह, तकनीकी अधिकारी, आइएसटीसी को 50वीं बार रक्तदान करने पर सम्मानित किया।

खेल गतिविधियां

आइएसटीसी विद्यार्थियों के लिए अंतर्कक्षा मैच भी करवाए गए। इण्डोर मैचों में चैस, बैडमिंटन, कैंरम, टेबल टेनिस तथा लॉन टेनिस के मैच हुए। जबकि आउटडोर खेलों में छात्रों ने वॉलीबॉल, फुटबॉल, बास्केट बॉल तथा क्रिकेट में भाग लिया। प्रशिक्षण केन्द्र की छात्राओं ने भी कई खेलों में भाग लिया और पुरस्कार प्राप्त किए।

आइएसटीसी प्रवेश परीक्षा 2004

आइएसटीसी में प्रवेश के लिए प्रवेश परीक्षा दिनांक 8 अगस्त, 2004 को आयोजित की गई तथा नया सत्र 30 अगस्त, 2004 से प्रारंभ हुआ।

एनसीसी क्रियाकलाप

वार्षिक एनसीसी प्रशिक्षण शिविर अक्टूबर, 2004 में हाई ग्राउंड, एयर फोर्स स्टेशन, जीरकपुर में आयोजित किया गया इसमें आइएसटीसी से 30 कैडेटों ने भाग लिया।

आइएसटीसी के 35 कैडेटों ने 26 जनवरी, 2005 को गणतंत्र दिवस परेड में भाग लिया।

उद्योग को प्रदान की गई सहायता

आइएसटीसी ने जॉब वर्क आधार पर बाह्य अभिकरणों को सेवाएं उपलब्ध करवाई तथा साथ ही उद्योगों के कर्मियों के लिए विभिन्न अल्पकालीन प्रशिक्षण कार्यक्रम आयोजित किए। उद्योगों की विशिष्ट मांग पर 'सीएनसी मिलिंग पार्ट प्रोग्रामिंग, प्रिंसीपल टर्निंग प्रैक्टिसिस, डिजाइन ऑफ प्रैस टॉल्स आदि' विषय पर प्रशिक्षण कार्यक्रम आयोजित किए गए।

आयोजित किए गए प्रशिक्षण कार्यक्रम

सीएसआइआर के मानव संसाधन केन्द्र द्वारा सीएसआइआर के पदाधिकारियों के लिए 22-26 नवंबर, 2004 को Accrual Based Accounting System and Impact Software for the Finance विषय पर प्रशिक्षण

कार्यक्रम आयोजित किया गया, जिसका उद्घाटन संगठन निदेशक डॉ पवन कपूर ने किया। 22-23 नवंबर, 2004 को सीएसआइआर की विभिन्न प्रयोगशालाओं यथा आरआरएल, जम्मू ; आइएचबीटी, पालमपुर ; सीबीआरआइ, लखनऊ ; सीमैप, लखनऊ ; एमइआरएडीओ, लुधियाना ; आइटीआरसी, लखनऊ ; एचआरडीसी, गाजियाबाद ; आइएमटी, चण्डीगढ़ ; और सीएसआइओ, चण्डीगढ़ के 27 प्रक्षिप्तुओं ने भाग लिया। जबकि 25-26 नवंबर, 2004 को आरआरएल, जोरहाट ; सीजीसीआरआइ, कोलकाता ; सीएफआरआइ, धनबाद ; आइआइसीबी, कोलकाता ; सीएमआरआइ, धनबाद ; सीएमइआरआइ, दुर्गापुर ; एचआरडीसी, गाजियाबाद ; एनएमएल, जमशेदपुर ; आइएमटी, चण्डीगढ़ ; और सीएसआइओ, चण्डीगढ़ से 28 प्रक्षिप्तुओं के दूसरे समूह को प्रशिक्षण प्रदान किया गया। कार्यक्रम के दौरान सीएसआइआर से अनेक विख्यात विशेषज्ञों ने व्याख्यान दिए। सीएसआइओ, चण्डीगढ़ में इस प्रशिक्षण कार्यक्रम का आयोजन श्री सुशील कुमार कौड़ा, वैज्ञानिक 'एफ' ने किया।

उच्चतर शैक्षिक योग्यता

श्री सी. घनश्याम, वैज्ञानिक 'ई।।' को गुरु नानक देव विश्वविद्यालय, अमृतसर द्वारा विज्ञान संकाय में पीएच. डी. की डिग्री प्रदान की गई है। उनके शोध प्रबंध का विषय "स्टडी ऑफ स्पिन कोटिड टिन ऑक्साइड गैस सेंसर्स" था।

प्रशिक्षण प्राप्ति

श्री सुभाष चन्द्र जैन, वैज्ञानिक 'ई।।' सितंबर, 2004 के दौरान M/sTui-Laser, Germering, जर्मनी से KrF Excimer Laser (248 nm) के अनुरक्षण एवं प्रचालन पर प्रशिक्षण प्राप्त किया।

सम्मान एवं पुरस्कार

सीएसआइओ के वैज्ञानिकों को स्मार्ट टैक्नोलॉजी पुरस्कार

आइएसएएमपीई, बंगलूर ने सीएसआइओ के वैज्ञानिकों के दल द्वारा 'डैवलपमेंट ऑफ एक्सट्रिंसिक फेब्री पिरोट इंटरफेरोमीट्रिक (ईएफपीआइ) सेंसर्स फॉर स्मार्ट

टैक्नोलॉजी एप्लीकेशन्स' पर किए गए कार्य को वर्ष 2004 के लिए स्मार्ट टैक्नोलॉजी डैवलपमेंट हेतु 'के. सूर्यनारायण राव स्मृति पुरस्कार' के लिए चुना। यह पुरस्कार डॉ. राम प्रकाश बाजपेयी, तत्कालीन निदेशक, सीएसआइओ; डॉ. ए. के. अग्रवाल, तत्कालीन वैज्ञानिक 'जी' ; श्री एन. एस. मेहला, वैज्ञानिक 'एफ' तथा श्री सुभाष चंद्र जैन, तत्कालीन वैज्ञानिक 'ई।।' की टीम को आइएसएएमपीई ने अपनी 18वीं वार्षिक आम बैठक में दिनांक 30 जुलाई, 2004 को एनएएल, बंगलूर में आयोजित कार्यक्रम में प्रदान किया।

विकसित किया गया यह संवेदी अत्यंत महत्त्वपूर्ण एवं उपयोगी है, क्योंकि यह वाहनों के ट्रैफिक नियंत्रण एवं विस्फोट के दबाव मापन सहित भवनों, पुलों, वायुयानों तथा रन-वे जैसी संरचनाओं की मॉनीटरिंग के लिए अद्वितीय एवं महत्त्वपूर्ण लाभ प्रदान करता है। यह भावी स्मार्ट संरचनाओं तथा प्रणालियों का उपयोगी संघटन उपलब्ध करवाता है। इस प्रकार की संरचनाओं में अपने पर्यावरण को भांपने तथा तदनुसार प्रतिक्रिया करने की क्षमता होती है। इसके उदाहरणों में भवन, जो भूकम्प को भांपते हुए प्रतिक्रिया कर स्वयं को बचाते हैं तथा ऐसे वायुयान, जो क्षति को भांपते हुए स्वतः ही मरम्मत का कार्य करते हैं, शामिल हैं। इस प्रकार के कार्य को सफलतापूर्वक करने के लिए, एक तंत्रिका प्रणाली का होना आवश्यक है, जो कि ठीक जीवंत वस्तुओं के समान कार्य करती हो - अर्थात् पर्यावरण को भांपकर, सीपीयू (मस्तिष्क) को सूचना भेजे तथा तदनुसार प्रतिक्रिया करे। इस प्रकार की संरचनाओं की सफलता की कुंजी उनकी संवेदन-क्षमता है। फाइबर ऑप्टिक संवेदी प्रौद्योगिकी ने इसे संभव बनाया है। ये संवेदी प्रणालियां संरचनाओं में लगाई जा सकती हैं। इससे संरचना की दृढ़ता में कोई कमी नहीं आती तथा अंतर्निर्मित तंत्रिका प्रणाली के साथ स्मार्ट संरचनाओं का निर्माण होता है।

यह संवेदी नाभिकीय विज्ञान अनुसंधान बोर्ड (बीआरएनएस), आण्विक ऊर्जा विभाग, भारत सरकार द्वारा वित्तपोषित परियोजना के अंतर्गत विकसित किया गया। संवेदी का कार्यनिष्पादन तुलनात्मक दृष्टि से परम्परागत स्ट्रेन गेजिस के अनुरूप पाया गया।

स्टाफ की क्षेत्रवार तैनाती (31 मार्च, 2005 को)

निदेशक सचिवालय में कार्यरत स्टाफ

नाम	पदनाम	नाम	पदनाम
डॉ. पवन कपूर	निदेशक	श्री अमरीक सिंह	डाइवर ग्रुप II(3)
सुश्री विनीता भटनागर	डाक्यूमेंटेशन अधिकारी ओल्ड (5)	श्री भरोसा सिंह	सुरक्षा गार्ड (एसीपी)
श्री एस एम राणा	वरिष्ठ आशुलिपिक (एसीपी)	श्री राकेश कुमार	चपरासी
श्री अतुल सेठी	सहायक (सा.) ग्रेड III		

कृषि एवं भू-वैज्ञानिक उपकरण विन्यास में कार्यरत स्टाफ

नाम	पदनाम	नाम	पदनाम
श्री ए डी कौल	वैज्ञानिक ग्रुप IV(5)	श्री अमोल पी भोंडेकर	वैज्ञानिक ग्रुप IV(1)
श्री बी के शर्मा	वैज्ञानिक ग्रुप IV(5)	श्री मंजीत सिंह	वैज्ञानिक ग्रुप IV(1)
श्री अमोद कुमार	वैज्ञानिक ग्रुप IV(5)	श्री बी एस बन्सोद	वैज्ञानिक ग्रुप IV(1)
श्री वी पी गिरधर	वैज्ञानिक ग्रुप IV(5)	श्री संदीप कालरा	वैज्ञानिक ग्रुप IV(1)
श्री एस एस रंधावा	वैज्ञानिक ग्रुप IV(4)	श्री विष्णु कुमार पाण्डेय	वैज्ञानिक ग्रुप IV(1)
श्री एस के मित्तल	वैज्ञानिक ग्रुप IV(4)	श्री अरिंदम चैटर्जी	वैज्ञानिक ग्रुप IV(1)
श्री प्रदीप कुमार	वैज्ञानिक ग्रुप IV(4)	श्री मदन लाल	तकनीशियन ग्रुप II(4)
श्री डी के बन्दोपाध्याय	वैज्ञानिक ग्रुप IV(3)	सुश्री रजनी	तकनीकी अधिकारी ग्रुप III(3)
श्री लाल सिंह	तकनीकी अधिकारी ग्रुप III(6)	सुश्री बन्दना	तकनीकी अधिकारी ग्रुप III(3)
श्री ज्ञान चंद	तकनीकी अधिकारी ग्रुप III(5)	श्री आर एस शौंडा	तकनीकी अधिकारी ग्रुप III(3)
श्री वी डी शिवलिंग	वैज्ञानिक ग्रुप IV(2)	श्री स्वर्णजीत सिंह	तकनीकी अधिकारी ग्रुप III(3)
श्री सतीश कुमार	वैज्ञानिक ग्रुप IV(2)	सुश्री तरविन्दर कौर	तकनीकी अधिकारी ग्रुप III(3)
श्री ए जी सोनकुसारे	वैज्ञानिक ग्रुप IV(2)	श्री धन्ना लाल मीणा	तकनीकी अधिकारी ग्रुप III(3)
सुश्री कान्ता गर्ग	तकनीकी अधिकारी ग्रुप III(5)	श्री मदन लाल	तकनीकी अधिकारी ग्रुप III(3)
सुश्री जसजीत कौर	तकनीकी अधिकारी ग्रुप III(5)	श्री मेहर चंद	तकनीकी अधिकारी ग्रुप III(3)
श्री सुब्रो एस ठाकुर	वैज्ञानिक ग्रुप IV(2)	श्री अजय कु. सक्सेना	तकनीशियन ग्रुप II(3)
सुश्री शशि शर्मा	तकनीकी अधिकारी ग्रुप III(5)	श्री अमित गुप्ता	तकनीकी सहायक ग्रुप III(1)
श्री वी के मोहल	तकनीकी अधिकारी ग्रुप III(4)	सुश्री चमेली रानी	तकनीकी सहा. स्टाफ ग्रुप I(4)
सुश्री भूपिन्दर कौर	तकनीकी अधिकारी ग्रुप III(4)	श्री ओम प्रकाश	वरि. आशुलिपिक (एसीपी)

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चिकित्सा उपकरण विन्यास एवं विकलांगों के लिए इंटैलिजेंट प्रौस्थेटिक उपस्कर (पीटीआईडी, बीडीजी एवं पुस्तकालय सहित) में कार्यरत स्टाफ

नाम	पदनाम	नाम	पदनाम
श्री एस आर तनेजा	वैज्ञानिक ग्रुप IV(6)	सुश्री जसप्रीत कौर	वैज्ञानिक ग्रुप IV(1)
श्री कुलविन्द्र सिंह	वैज्ञानिक ग्रुप IV(5)	श्री जगवीर सिंह	वैज्ञानिक ग्रुप IV(1)
श्री आर एन सेनगुप्ता	वैज्ञानिक ग्रुप IV(5)	श्री जी पी गेरा	तकनीशियन ग्रुप II(4)
डॉ. एच के सरदाना	वैज्ञानिक ग्रुप IV(5)	श्री श्याम किशोर	तकनीकी अधिकारी ग्रुप III(3)
श्री एस एस आहलूवालिया	वैज्ञानिक ग्रुप IV(4)	श्री चांद राम शर्मा	तकनीकी अधिकारी ग्रुप III(3)
डॉ. पी के जैन	वैज्ञानिक ग्रुप IV(4)	श्री पी एस नेगी	तकनीकी अधिकारी ग्रुप III(3)
श्री जे एस सबरवाल	वैज्ञानिक ग्रुप IV(4)	सुश्री शशि खन्ना	तकनीशियन ग्रुप II(4)
श्री आर सी गुप्ता	वैज्ञानिक ग्रुप IV(4)	श्री रमेश चन्द्र	तकनीशियन ग्रुप II(4)
सुश्री सुकन्या भसीन	वैज्ञानिक ग्रुप IV(4)	श्री टी के वोहरा	तकनीशियन ग्रुप II(4)
श्री विजय सहगल	तकनीकी अधिकारी ग्रुप III(6)	श्री महंगा सिंह	तकनीशियन ग्रुप II(3)
श्री दयाल सिंह	तकनीकी अधिकारी ग्रुप III(6)	श्री टी एस नेगी	तकनीशियन ग्रुप II(3)
सुश्री त्रिलोचन कौर	तकनीकी अधिकारी ग्रुप III(5)	श्री जरनैल सिंह	तकनीशियन ग्रुप II(3)
श्री आर एस नैयर	तकनीकी अधिकारी ओल्ड (5)	सुश्री अमरजीत कौर	तकनीशियन ग्रुप II(3)
श्री दीपक कुमार	तकनीकी अधिकारी ओल्ड (5)	श्री एस के अरोड़ा	तकनीशियन ग्रुप II(2)
श्री दिनेश पंकज	वैज्ञानिक ग्रुप IV(2)	श्री गंगा प्रसाद	तकनीकी सहा. स्टाफ ग्रुप I(4)
सुश्री सुदेश बच्छल	तकनीकी अधिकारी ग्रुप III(5)	श्री राम सिंह	तकनीकी सहा. स्टाफ ग्रुप I(4)
श्री एच एन भार्गव	वैज्ञानिक ग्रुप IV(2)	श्री चन्दर पाल	तकनीकी सहा. स्टाफ ग्रुप I(4)
श्री संजीव वर्मा	वैज्ञानिक ग्रुप IV(2)	श्री पवन कुमार	तकनीकी सहा. स्टाफ ग्रुप I(3)
श्री एस के शर्मा	तकनीकी अधिकारी ओल्ड (4)	श्री छेदी लाल	तकनीकी सहा. स्टाफ ग्रुप I(3)
श्री जे एस बैदवान	तकनीकी अधिकारी ओल्ड (4)	सुश्री हरभजन कौर	तकनीकी सहा. स्टाफ ग्रुप I(2)
सुश्री सरोज बत्रा	तकनीकी अधिकारी ग्रुप III(4)	श्री नरेश कुमार	कनिष्ठ आशुलिपिक (एसीपी)
श्री निलेश कुमार	वैज्ञानिक ग्रुप IV(I)	सुश्री गारगी देवी	कनिष्ठ आशुलिपिक (एसीपी)
श्री जगदीश कुमार	वैज्ञानिक ग्रुप IV(1)	सुश्री मीना रानी	कनिष्ठ आशुलिपिक

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कॉकपिट उपकरण विन्यास एवं ऑप्टो-मकैनिकल सिस्टम में कार्यरत स्टाफ

नाम	पदनाम	नाम	पदनाम
श्री पी के जैन	वैज्ञानिक ग्रुप IV(6)	श्री ए रोबर्ट सैम	वैज्ञानिक ग्रुप IV(2)
श्री पी के गोयल	वैज्ञानिक ग्रुप IV(5)	श्री आर एस नेगी	तकनीकी अधिकारी ओल्ड (4)
श्री वी पी एस कलसी	तकनीकी अधिकारी ग्रुप III(7)	श्री अशोक के सूद	तकनीकी अधिकारी ग्रुप III(4)
श्री जी एस सिंह	वैज्ञानिक ग्रुप IV(4)	सुश्री राजकुमारी	तकनीकी अधिकारी ग्रुप III(4)
श्री रणधीर भटनागर	वैज्ञानिक ग्रुप IV(4)	श्री ओ पी चावला	तकनीकी अधिकारी ओल्ड (4)
डॉ. एस वी रामगोपाल	वैज्ञानिक ग्रुप IV(4)	श्री मंगत सिंह	तकनीकी अधिकारी ग्रुप III(4)
श्री पी के राव	वैज्ञानिक ग्रुप IV(4)	श्री ए के वत्स	तकनीकी अधिकारी ग्रुप III(4)
श्री आर सी कालोनिया	वैज्ञानिक ग्रुप IV(4)	श्री नरेश शर्मा	तकनीकी अधिकारी ग्रुप III(4)
श्री विनय कुमार	वैज्ञानिक ग्रुप IV(4)	श्री देविन्दर सिंह	तकनीकी अधिकारी ग्रुप III(4)
श्री सी आर प्रसाद	वैज्ञानिक ग्रुप IV(4)	श्री गुफरान सैयद खान	वैज्ञानिक ग्रुप IV(1)
श्री पी पी बाजपेयी	वैज्ञानिक ग्रुप IV(4)	श्री एस एस सैनी	वैज्ञानिक ग्रुप IV(1)
श्री एच एस छगगर	तकनीकी अधिकारी ग्रुप III(6)	श्री विपन कुमार	वैज्ञानिक ग्रुप IV(1)
श्री नकली राम	तकनीकी अधिकारी ग्रुप III(6)	श्री संजय शर्मा	तकनीकी अधिकारी ग्रुप III(4)
श्री बंत सिंह	तकनीकी अधिकारी ओल्ड (5)	श्री महिपाल	वैज्ञानिक ग्रुप IV(1)
श्री देश राज तनेजा	तकनीकी अधिकारी ओल्ड (5)	श्री मनीष कुमार भट्ट	वैज्ञानिक ग्रुप IV(1)
श्री राम लाल जरवाल	तकनीकी अधिकारी ओल्ड (5)	श्री प्रभात कु. बघेल	वैज्ञानिक ग्रुप IV(1)
श्री विनोद करार	वैज्ञानिक ग्रुप IV(2)	श्री हैरी गर्ग	वैज्ञानिक ग्रुप IV(1)
श्री वी के खन्ना	तकनीकी अधिकारी ग्रुप III(5)	श्री संदीप सिंघई	वैज्ञानिक ग्रुप IV(1)
श्री बी बी बहुगुणा	तकनीकी अधिकारी ओल्ड (5)	श्री बी के गोस्वामी	तकनीकी अधिकारी ओल्ड (3)
श्री एस सी शर्मा	तकनीकी अधिकारी ओल्ड (5)	श्री जीवन सिंह	तकनीशियन ग्रुप III(4)
श्री चन्द्र मोहन	तकनीकी अधिकारी ग्रुप III(4)	श्री मेहर चन्द	तकनीशियन ग्रुप III(4)
श्री श्रवण कुमार	वैज्ञानिक ग्रुप IV(2)	श्री रमेश कुमार	तकनीशियन ग्रुप II(4)
श्री गुरदियाल	तकनीकी अधिकारी ग्रुप III(5)	श्री नानू राम	तकनीशियन ग्रुप II(4)
श्री गुरशरण सिंह	तकनीकी अधिकारी ग्रुप III(5)	श्री वरिन्दर सिंह	तकनीशियन ग्रुप II(4)
श्री सुरजीत सिंह	तकनीकी अधिकारी ओल्ड (5)	श्री टेक चंद सूद	तकनीशियन ग्रुप II(4)
श्री ए के मेहदीरत्ता	तकनीकी अधिकारी ओल्ड (5)	श्री आत्मा राम	तकनीशियन ग्रुप II(4)
श्री राधे श्याम	तकनीकी अधिकारी ग्रुप III(5)	श्री जे सी कपूर	तकनीशियन ग्रुप II(4)

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नाम	पदनाम	नाम	पदनाम
श्री भूपिन्दर सिंह रिहल	तकनीशियन ग्रुप II(4)	श्री जी के माथुर	तकनीशियन ग्रुप II(4)
श्री राम नाथ	तकनीशियन ग्रुप II(4)	श्री कुम्हार लाल	तकनीकी सहायक ग्रुप III(2)
श्री एस बी कुमार	तकनीकी अधिकारी ग्रुप III(3)	श्री बलदेव राज	तकनीशियन ग्रुप II(3)
श्री रमेश चंद गोयल	तकनीकी अधिकारी III(3)	श्री कृष्ण लाल	तकनीशियन ग्रुप II(3)
श्री ए के गुप्ता	तकनीकी अधिकारी III(3)	श्री सत पाल साहनी	तकनीशियन ग्रुप II(3)
श्री सोहन लाल	तकनीशियन ग्रुप II(4)	श्री राज कुमार	तकनीशियन ग्रुप II(3)
श्री हुसन लाल	तकनीशियन ग्रुप II(4)	श्री राम कुमार	तकनीशियन ग्रुप II(3)
श्री प्रदीप कुमार	तकनीशियन ग्रुप II(4)	श्री मुनीष कुमार	तकनीशियन ग्रुप II(3)
श्री सुरिन्द्र मोहन	तकनीशियन ग्रुप II(4)	श्री सतीश कुमार	तकनीशियन ग्रुप II(3)
श्री अमर नाथ	तकनीशियन ग्रुप II(4)	श्री चुन्नी लाल	तकनीशियन ग्रुप II(3)
श्री अशोक कु. सोबती	तकनीशियन ग्रुप II(4)	श्री दया शंकर	तकनीशियन ग्रुप II(3)
श्री जे पी दुबे	तकनीशियन ग्रुप II(4)	श्री बलजीत सिंह	तकनीशियन ग्रुप II(3)
श्री राम भज धीमान	तकनीशियन ग्रुप II(4)	सुश्री अंजना माथुर	तकनीशियन ग्रुप II(3)
श्री जलील अहमद	तकनीशियन ग्रुप II(4)	श्री पवन कुमार	तकनीशियन ग्रुप II(3)
श्री सतपाल	तकनीशियन ग्रुप II(4)	श्री एम सी शर्मा	तकनीशियन ग्रुप II(2)
श्री प्रेम नाथ	तकनीशियन ग्रुप II(4)	श्री बलदेव सिंह	तकनीशियन ग्रुप II(2)
श्री जोगिन्द्र सिंह	तकनीशियन ग्रुप II(4)	श्री बंसी लाल	तकनीकी सहा. स्टाफ ग्रुप I(4)
श्री दया राम	तकनीशियन ग्रुप II(4)	श्री ऊषा रानी	तकनीकी सहा. स्टाफ ग्रुप I(3)
श्री ज्ञान चन्द रूहानी	तकनीशियन ग्रुप II(4)	श्री ज्ञान चन्द सिंह	तकनीकी सहा. स्टाफ ग्रुप I(3)
श्री आर डी शर्मा	तकनीशियन ग्रुप II(4)	श्री ए के ढिंगरा	निजी सचिव
श्री वी के बंसल	तकनीशियन ग्रुप II(4)	श्री हरि प्रसाद	चपरासी ग्रेड II

फाइबर/लेजर ऑप्टिक्स आधारित उपकरण विन्यास (आइएसटीसी सहित)
में कार्यरत स्टाफ

नाम	पदनाम	नाम	पदनाम
डॉ. आर के जैन	वैज्ञानिक ग्रुप IV(5)	श्री आर सी अरोड़ा	वैज्ञानिक ग्रुप IV(5)
श्री वी के शर्मा	वैज्ञानिक ग्रुप IV(5)	श्री एस एस तोमर	वैज्ञानिक ग्रुप IV(5)
श्री एन एस मेहला	वैज्ञानिक ग्रुप IV(5)	श्री जे के छाबड़ा	वैज्ञानिक ग्रुप IV(5)

स्टाफ का क्षेत्रवार तैनाती (31 मार्च, 2005 को)

नाम	पदनाम	नाम	पदनाम
श्री एच एस गुप्ता	वैज्ञानिक ग्रुप IV(5)	श्री एन एस औलख	वैज्ञानिक ग्रुप IV(1)
श्री सुशील कुमार	वैज्ञानिक ग्रुप IV(5)	श्री जी सी पोद्दार	तकनीकी अधिकारी ग्रुप III(4)
श्री सुभाष सी जैन	वैज्ञानिक ग्रुप IV(5)	श्री नरिन्द्र सिंह	वैज्ञानिक ग्रुप IV(1)
श्री के डी चट्टोपाध्याय	तकनीकी अधिकारी ग्रुप III(7)	श्री परमिन्द्र सिंह	तकनीकी अधिकारी ग्रुप III(3)
श्री एन सी हीरा	तकनीकी अधिकारी ओल्ड (7)	श्री हरीचन्द सिंह	तकनीकी अधिकारी ग्रुप III(3)
श्री के के थरियन	तकनीकी अधिकारी ग्रुप III(7)	श्री मांगे राम	तकनीकी अधिकारी ग्रुप III(3)
श्री डी एस सियान	वैज्ञानिक ग्रुप IV(4)	श्री सुरिन्द्र सिंह	तकनीशियन ग्रुप II(4)
श्री आर सी अग्निहोत्री	वैज्ञानिक ग्रुप IV(4)	श्री मातादीन मीना	तकनीकी अधिकारी ग्रुप III(3)
श्री जितेन्द्र गुप्ता	तकनीकी अधिकारी ग्रुप III(6)	श्री प्रदीप कुमार मांझी	तकनीकी अधिकारी ग्रुप III(3)
श्री एम डी फुक्कन	तकनीकी अधिकारी ग्रुप III(6)	श्री शीतल प्रकाश	तकनीशियन ग्रुप II(4)
श्री आर एस कथूरिया	तकनीकी अधिकारी ग्रुप III(6)	श्री रेशम लाल	तकनीशियन ग्रुप II(4)
श्री एस के मुखर्जी	तकनीकी अधिकारी ग्रुप III(6)	श्री प्रीतम सिंह	तकनीशियन ग्रुप II(4)
श्री के सी भाटिया	तकनीकी अधिकारी ओल्ड (6)	श्री पी आर पवार	डाफ्टमैन ग्रुप II(3)
श्री डी पी छाछिया	तकनीकी अधिकारी ग्रुप III (6)	श्री एन के श्रीवास्तव	तकनीशियन ग्रुप II(3)
श्री एम पी सिंह	तकनीकी अधिकारी ग्रुप III(6)	श्री वी के नन्दा	तकनीशियन ग्रुप II(3)
सुश्री ललिता टंडन	तकनीकी अधिकारी ग्रुप III(6)	श्री जगदीश लाल	तकनीशियन ग्रुप II(3)
श्री अमरजीत सिंह साम्पले	तकनीकी अधिकारी ओल्ड (5)	श्री चन्द्र शेखर	तकनीशियन ग्रुप II(3)
सुश्री आरआर अग्रवाल	पुस्तकालय अधि. ग्रुप III(5)	श्री त्रिलोचन सिंह	तकनीशियन ग्रुप II(3)
श्री मलकीयत सिंह	तकनीकी अधिकारी ओल्ड (5)	श्री ज्ञान चन्द	तकनीशियन ग्रुप II(3)
श्री संतोख सिंह	तकनीकी अधिकारी ओल्ड (5)	श्री बलवन्त सिंह	तकनीकी सहा. स्टाफ ग्रुप I(4)
श्री पिरथी राज	तकनीकी अधिकारी ग्रुप III(5)	श्री ओम प्रकाश	तकनीकी सहा. स्टाफ ग्रुप I(4)
श्री आर के भारद्वाज	तकनीकी अधिकारी ओल्ड (5)	सुश्री सुरिन्द्र पासी	वरि. आशुलिपिक (एसीपी)
श्री सतिन्दर कु. चौधरी	तकनीकी अधिकारी ग्रुप III(5)	श्री सतीश कु. शर्मा	सहा. (भं. एवं क्रय) ग्रेड I (एसीपी)
सुश्री आशा कुमार	तकनीकी अधिकारी ग्रुप III (5)	श्री पी सी सहदेव	सहायक (सा.) ग्रेड I
श्री के एस रतन	तकनीकी अधिकारी ग्रुप III(4)	सुश्री मधु मेहता	वरिष्ठ आशुलिपिक
श्री के श्रवण कुमार	तकनीकी अधिकारी ग्रुप III(4)	सुश्री मधु मल्होत्रा	सुरक्षा सहायक
श्री एस के बोथरा	तकनीकी अधिकारी ग्रुप III(4)	श्री जिले राम	रिकॉर्ड कीपर

स्टाफ की क्षेत्रवार तैनाती (31 मार्च, 2005 को)

विश्लेषणात्मक उपकरण विन्यास एवं मैम्स में कार्यरत स्टाफ

नाम	पदनाम	नाम	पदनाम
डॉ. आर पी बाजपेयी	वैज्ञानिक ग्रुप IV(7)	सुश्री सुनीता मिश्रा	वैज्ञानिक ग्रुप IV(2)
श्री ए के डिमरी	वैज्ञानिक ग्रुप IV(6)	डॉ. एस जी शर्मा	तकनीकी अधिकारी ग्रुप III(4)
श्री बासुदेव प्रसाद	वैज्ञानिक ग्रुप IV (5)	श्री बीएस आहलूवालिया	तकनीकी अधिकारी ग्रुप III(4)
श्री एस के आंगरा	वैज्ञानिक ग्रुप IV(5)	सुश्री वीरमिता मल्होत्रा	तकनीकी अधिकारी ग्रुप III(4)
श्री नथई राम	वैज्ञानिक ग्रुप IV(5)	श्री राजेश	वैज्ञानिक ग्रुप IV(1)
श्री ए के पॉल	वैज्ञानिक ग्रुप IV(5)	सुश्री मोनिका सिंगला	तकनीकी अधिकारी ग्रुप III(4)
श्री आरआर डोंगांवकर	वैज्ञानिक ग्रुप IV(4)	सुश्री हरजीत कौर	तकनीकी अधिकारी ग्रुप III(3)
डॉ. सी घनश्याम	वैज्ञानिक ग्रुप IV(4)	श्री सतिन्दर सिंह	तकनीशियन ग्रुप II(4)
सुश्री वीना चौधरी	वैज्ञानिक ग्रुप IV(4)	श्री कुलवंत सिंह	तकनीशियन ग्रुप II(4)
श्री वी वी महाजन	तकनीकी अधिकारी ओल्ड (5)	श्री गुलशन भागी	तकनीशियन ग्रुप II(3)
श्री वी के बिंदल	तकनीकी अधिकारी ग्रुप III(5)	श्री मोहन कुमार	तकनीशियन ग्रुप II(3)
श्री रघबीर सिंह	तकनीकी अधिकारी ओल्ड (5)	श्री राजिन्दर कुमार	तकनीशियन ग्रुप II(2)
सुश्री संगीता गर्ग	तकनीकी अधिकारी ग्रुप III(5)	श्री चमन लाल	तकनीकी सहा. स्टाफ ग्रुप I(3)
श्री के एस सोढी	तकनीकी अधिकारी ओल्ड (5)	सुश्री राजश्री	तकनीकी सहा. स्टाफ ग्रुप I(3)
श्री रामा नंद	तकनीकी अधिकारी ग्रुप III(5)	श्री अशोक कुमार	निजी सचिव
सुश्री आइ के वालिया	तकनीकी अधिकारी ओल्ड (5)	सुश्री पदम प्रेम चार्या	वरिष्ठ आशुलिपिक

एडवांस्ड मैटिरियल आधारित ट्रांसड्यूसर्ज में कार्यरत स्टाफ

नाम	पदनाम	नाम	पदनाम
डॉ. गौतम मित्रा	वैज्ञानिक ग्रुप IV(6)	श्री ए के शुक्ला	वैज्ञानिक ग्रुप IV(1)
डॉ. एम एल सिंगला	वैज्ञानिक ग्रुप IV(5)	श्री पी के महापात्रा	वैज्ञानिक ग्रुप IV(1)
डॉ. ललित एम भारद्वाज	वैज्ञानिक ग्रुप IV(5)	डॉ. राकेश कुमार	वैज्ञानिक ग्रुप IV(1)
श्री सुरेश चन्द जैन	वैज्ञानिक ग्रुप IV(4)	सुश्री इन्दरप्रीत कौर	वैज्ञानिक ग्रुप IV(1)
श्री वी आर हरचेकर	वैज्ञानिक ग्रुप IV(4)	श्री विधु शेखर पांडे	वैज्ञानिक ग्रुप IV(1)
श्री मेवा सिंह	वैज्ञानिक ग्रुप IV(4)	श्री एन पी हरि	तकनीकी सहा. स्टाफ ग्रुप I(3)
सुश्री लक्ष्मी पाण्डेय	तकनीकी अधिकारी ग्रुप III(5)	श्री सतीश कुमार	वरि. आशुलिपिक
श्री अश्विनी कुमार	तकनीकी अधिकारी ग्रुप III(5)	श्री अनिल कुमार	वरि. आशुलिपिक

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सेवा व अनुरक्षण प्रभाग/केन्द्र, चण्डीगढ़/दिल्ली/जयपुर/चेन्नई में कार्यरत स्टाफ

नाम	पदनाम	नाम	पदनाम
श्री आर के मोहनराव	वैज्ञानिक ग्रुप IV(5)	श्री ए के शर्मा	तकनीकी अधिकारी ग्रुप III(5)
श्री एस सिवागामिनाथन	वैज्ञानिक ग्रुप IV(5)	श्री चन्द्र भूषण	तकनीकी अधिकारी ओल्ड (4)
श्री टी आर नटराजन	वैज्ञानिक ग्रुप IV(5)	सुश्री संतोष जैन	तकनीकी अधिकारी ग्रुप III(4)
श्री एन के शर्मा	वैज्ञानिक ग्रुप IV(5)	श्री डी कृष्णामूर्थी	तकनीकी अधिकारी ग्रुप III(4)
श्री एच के पीर	वैज्ञानिक ग्रुप IV(5)	श्री एम गणेशन	वैज्ञानिक ग्रुप IV(1)
श्री पी वी तलवार	वैज्ञानिक ग्रुप IV(4)	श्री पी के शर्मा	तकनीकी अधिकारी ग्रुप III(4)
श्री एम एस बागेश्वर	वैज्ञानिक ग्रुप IV(4)	श्री धीरेन्द्र बंसल	वैज्ञानिक ग्रुप IV(1)
डॉ. एस के चौहान	वैज्ञानिक ग्रुप IV(4)	श्री सी सेथुरमन	वैज्ञानिक ग्रुप IV(1)
श्री गोबिन्द कुमार	वैज्ञानिक ग्रुप IV(4)	श्री जी एस अय्यपन	वैज्ञानिक ग्रुप IV(1)
श्री सी जे राव	वैज्ञानिक ग्रुप IV(4)	श्री आई एस ग्रेवाल	तकनीशियन ग्रुप II(4)
श्री ए के शर्मा	वैज्ञानिक ग्रुप IV(4)	सुश्री अरुणा अत्री	तकनीकी अधिकारी ग्रुप III(3)
श्री कोटा श्रीनिवास	वैज्ञानिक ग्रुप IV(4)	श्री उपेन्द्र कुमार	तकनीकी अधिकारी ग्रुप III(3)
श्री आर देवराजन	वैज्ञानिक ग्रुप IV(4)	श्री कैलाश चन्द	तकनीकी अधिकारी ग्रुप III(3)
सुश्री हेमामालिनी कस्तूरी	वैज्ञानिक ग्रुप IV(4)	श्री एन विवेकानन्दम	तकनीकी अधिकारी ग्रुप III(3)
सुश्री सुधा वीएम राव	वैज्ञानिक ग्रुप IV(3)	श्री देश राज	डाइवर ग्रुप II(4)
श्री एस राधाकृष्णन	वैज्ञानिक ग्रुप IV(3)	श्री अमर सिंह	डाइवर ग्रुप II(4)
श्री के पी चौधरी	वैज्ञानिक ग्रुप IV(3)	श्री सीता राम	तकनीशियन ग्रुप II(4)
श्री रविन्दर कुमार	तकनीकी अधिकारी ग्रुप III(6)	श्री सरदूल सिंह	तकनीशियन ग्रुप II(3)
सुश्री पी चिन्तामर्ई सेल्वम	वैज्ञानिक ग्रुप IV(3)	श्री ए के तनेजा	तकनीशियन ग्रुप III(3)
श्री सीता राम	तकनीकी अधिकारी ओल्ड (6)	श्री ब्रिज मोहन	तकनीशियन ग्रुप II(3)
सुश्री मीनालोचिनी चन्द्र	तकनीकी अधिकारी ग्रुप III(6)	श्री के आर ए नायर	तकनीशियन ग्रुप II(3)
श्री धनवन्त सिंह	तकनीकी अधिकारी ओल्ड (6)	श्री शांति लाल	तकनीशियन ग्रुप II(3)
डॉ. पी के अवस्थी	वैज्ञानिक ग्रुप IV(2)	श्री एफ ई डी प्रसाद	तकनीशियन ग्रुप II(3)
श्री सुनील खन्ना	तकनीकी अधिकारी ओल्ड (5)	श्री के राजू	तकनीशियन ग्रुप II(3)
श्री ए एस पनवार	तकनीकी अधिकारी ग्रुप III(5)	श्री आरवी सेलवाराजन	तकनीशियन ग्रुप II(3)
श्री एच पी सयाल	तकनीकी अधिकारी ओल्ड (5)	श्री एस दिल्ली	तकनीशियन ग्रुप II(3)
श्री राम महेश पाल	तकनीकी अधिकारी ग्रुप III(5)	श्री प्रेम राज	तकनीशियन ग्रुप II(3)
सुश्री शशि मोइत्रा	तकनीकी अधिकारी ग्रुप III(5)	सुश्री ललिथा शर्मा	तकनीशियन ग्रुप II(3)

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नाम	पदनाम	नाम	पदनाम
श्री निरंजन सिंह	तकनीकी सहा. स्टाफ ग्रुप I(4)	सुश्री कृष्णा कौशिक	सहायक (सा.) ग्रेड II
श्री पी वेलमनिक्कम	तकनीकी सहा. स्टाफ ग्रुप I(4)	श्री आर गोपीनाथ	सहायक (सा.) ग्रेड III
श्री एस के बत्ता	तकनीशियन ग्रुप II(1)	श्री सीता राम	सफाईवाला ग्रेड II
श्री कारू गुनयान	तकनीकी सहा. स्टाफ ग्रुप I(3)	श्री वी पी थापा	सुरक्षा गार्ड
श्री स्वर्ण सिंह	तकनीकी सहा. स्टाफ ग्रुप I(3)	श्री एम रमेश	चपरासी
सुश्री सुषमा रानी	कनि. आशुलिपिक (एसीपी)		

इंजीनियरिंग सेवाओं (सिविल/इलैक्ट्रिकल/रैफ्रिजरेशन) में कार्यरत स्टाफ

नाम	पदनाम	नाम	पदनाम
श्री बी एस विरदी	वैज्ञानिक ग्रुप IV(4)	श्री बिशान दास	तकनीशियन ग्रुप II(3)
श्री पी के गर्ग	अधीक्षक अभियन्ता ग्रुप III(6)	श्री सतीश कुमार	तकनीशियन ग्रुप II(3)
श्री जावर सिंह	तकनीकी अधिकारी ओल्ड (5)	श्री अशोक कुमार	तकनीशियन ग्रुप II(3)
श्री वी के गुप्ता	सहा. कार्य. अभियन्ता ग्रुप III(4)	श्री मलकीत सिंह कल्याण	तकनीशियन ग्रुप II(3)
श्री वी के सिंह	सहा. कार्य. अभियन्ता ग्रुप III(4)	श्री मोहन सिंह	तकनीशियन ग्रुप II(3)
श्री मदन शर्मा	सहा. कार्य. अभियन्ता ग्रुप III(4)	श्री बलवंत सिंह	तकनीशियन ग्रुप II(3)
श्री हरि दास	सहायक अभियन्ता ग्रुप III(3)	श्री कुलवीर सिंह	तकनीशियन ग्रुप II(3)
श्री सुन्दर लाल	सहायक अभियन्ता ग्रुप III(3)	श्री अरुण कुमार	कनिष्ठ अभियन्ता ग्रुप III(1)
श्री कंवलजीत सिंह	तकनीकी अधिकारी ग्रुप III(3)	श्री फकीर चन्द	तकनीकी सहा. स्टाफ ग्रुप I(4)
श्री बदरी प्रसाद	तकनीशियन ग्रुप II(4)	श्री पूरण चन्द	तकनीकी सहा. स्टाफ ग्रुप I(4)
श्री प्रीतम पाल बरयाह	तकनीशियन ग्रुप II(4)	श्री मोहन लाल	तकनीकी सहा. स्टाफ ग्रुप I(4)
श्री हरमेश लाल	तकनीशियन ग्रुप II(4)	श्री सादा सिंह	तकनीकी सहा. स्टाफ ग्रुप I(3)
श्री बाबू लाल	तकनीशियन ग्रुप II(4)	श्री राम बोध	तकनीकी सहा. स्टाफ ग्रुप I(3)
श्री जंग बहादुर	तकनीशियन ग्रुप II(4)	श्री सुरेश पाल	तकनीकी सहा. स्टाफ ग्रुप I(3)
श्री मनी राम	तकनीशियन ग्रुप II(4)	श्री मोहन लाल	वरिष्ठ आशुलिपिक (एसीपी)
श्री जागीर सिंह	तकनीशियन ग्रुप II(4)	श्री कुलदीप सी शर्मा	सहायक (सा.) ग्रेड I
श्री हरचन्द सिंह	तकनीशियन ग्रुप II(4)	श्री राजेश कुमार	कनि. आशुलिपिक
श्री कश्मीर सिंह	तकनीशियन ग्रुप II(3)	श्री जय नारायण	सफाईवाला (एसीपी)
श्री राज कुमार	तकनीशियन ग्रुप II(3)		

स्टाफ को क्षेत्रवार तैनाती (31 मार्च, 2005 को)

प्रशासन में कार्यरत स्टाफ

नाम	पदनाम	नाम	पदनाम
श्री एम आर मसान	प्रशासन नियंत्रक	श्री दर्शन सिंह	सहायक (सा.) ग्रेड ॥
श्री ए के मुखर्जी	प्रशासनिक अधिकारी	सुश्री जगजीत कौर	सहायक (सा.) ग्रेड ॥
सुश्री नीरू	वरिष्ठ हिंदी अधिकारी	सुश्री कमलेश रानी सरीन	सहायक (सा.) ग्रेड ॥
श्री ओम प्रकाश	अनुभाग अधिकारी (सा.)	श्री रमेश चन्द	सहायक (सा.) ग्रेड ॥
श्री एल एस नेगी	अनुभाग अधिकारी (सा.)	श्री विरेन्द्र लांबा	कनि. आशुलिपिक
श्री जसवंत राय	अनुभाग अधिकारी (सा.)	सुश्री प्रीति	कनि. आशुलिपिक
श्री कीमती लाल	अनुभाग अधिकारी (सा.)	श्री मनोज कुमार	सहायक (सा.) ग्रेड ॥
श्री हरनेक सिंह	वरिष्ठ आशुलिपिक	श्री बृज मोहन	सहायक (सा.) ग्रेड ॥
श्री अवतार सिंह	वरिष्ठ आशुलिपिक	श्री तरसेम लाल	रिकॉर्ड कीपर
श्री अमर जीत	सहायक (सा.) ग्रेड ।	श्री धन सिंह	चपरासी ग्रेड ॥
श्री अमर सिंह	वरिष्ठ हिंदी आशुलिपिक	श्री हरपाल सिंह	चेयर केनर ग्रेड ॥
श्री राकेश कुमार	सहायक (सा.) ग्रेड ।	सुश्री अंगूरी	चपरासी ग्रेड ॥
श्री मोहिन्द्र सिंह	सहायक (सा.) ग्रेड ।	श्री बनवारी लाल	चपरासी
श्री ज्ञान चंद	सहायक (सा.) ग्रेड ।	श्री अनूप शर्मा	चपरासी
श्री सी ए बोध	सहायक (सा.) ग्रेड ।	श्री शिव राज कुमार	चपरासी
श्री सतीश कुमार	सहायक (सा.) ग्रेड ।	श्री राकेश चन्द	चपरासी
श्री ओ पी शर्मा	सहायक (सा.) ग्रेड ।	श्री बिपन कुमार आचार्य	चपरासी
सुश्री अनिता ग़ोवर	सहायक (सा.) ग्रेड ।	श्री राकेश शर्मा	चपरासी
श्री वरिन्द्र सिंह	सहायक (सा.) ग्रेड ।	श्री बृजेश कुमार	फराश
श्री हरीश कुमार	सहायक (सा.) ग्रेड ।	श्री जगमोहन सिंह	चपरासी
श्री उमेश कुमार यादव	सहायक (सा.) ग्रेड ।	श्री धर्म सिंह	स्टाफ कार डाइवर ग्रुप ॥(4)
श्री सुधांशु शेखर राँय	सहायक (सा.) ग्रेड ।	श्री रतन सिंह	स्टाफ कार डाइवर ग्रुप ॥(4)
श्री दया नन्द	सहायक (सा.) ग्रेड ।	श्री हरभजन सिंह	स्टाफ कार डाइवर ग्रुप ॥(2)
श्री वरयाम सिंह	सहायक (सा.) ग्रेड ।	श्री दिलबाग सिंह	स्टाफ कार डाइवर ग्रुप ॥(2)
डॉ. लोकेश शर्मा	कनिष्ठ हिंदी अनुवादक	श्री सुमन कुमार	स्टाफ कार डाइवर
श्री इन्द्रजीत सिंह	टैलिफोन ऑपरेटर	श्री जसपाल सिंह	स्टाफ कार डाइवर
श्री पवन कुमार शर्मा	सहायक (सा.) ग्रेड ॥	श्री रविन्द्र कुमार	तकनीकी सहा. स्टाफ ग्रुप ॥(4)
		श्री सितार	तकनीकी सहा. स्टाफ ग्रुप ॥(3)
		सुश्री भजन कौर	तकनीकी सहा. स्टाफ ग्रुप ॥(3)

स्टाफ की क्षेत्रवार तैनाती (31 मार्च, 2005 को)

वित्त एवं लेखा अनुभाग में कार्यरत स्टाफ

नाम	पदनाम	नाम	पदनाम
श्री सुख राम	वित्त एवं लेखा नियंत्रक	सुश्री इन्दु बाला	सहायक (वि. एवं ले.) ग्रेड ॥
श्री एस सी जुनेजा	वरिष्ठ वि. एवं ले. अधि.	सुश्री कुसुम लता	सहायक (वि. एवं ले.) ग्रेड ॥
श्री जे पी इन्दोरा	अनुभाग अधिकारी (वि. एवं ले.)	श्री ओम पाल सिंह	सहायक (वि. एवं ले.) ग्रेड ॥
श्री एम के शर्मा	अनुभाग अधिकारी (वि. एवं ले.)	सुश्री कविता चौहान	सहायक (वि. एवं ले.) ग्रेड ॥
श्री निर्मल सिंह	सहायक (वि. एवं ले.) ग्रेड ।	श्री गजना राम	रिकॉर्ड कीपर
श्री मुनी लाल	सहायक (वि. एवं ले.) ग्रेड ।	सुश्री कमलेश कुमारी	सहायक (वि. एवं ले.) ग्रेड ॥
श्री एन रामामूर्ती	सहायक (वि. एवं ले.) ग्रेड ।	श्री सोहन सिंह	सहायक (वि. एवं ले.) ग्रेड ॥
श्री एस के नारद	सहायक (वि. एवं ले.) ग्रेड ।	श्री बिशन दास	चपरासी
श्री सुकेश कुमार	वरिष्ठ आशुलिपिक	श्री राजपाल सिंह	चपरासी
सुश्री जनक शर्मा	सहायक (सा.) ग्रेड ।	सुश्री सीमा मेहता	तकनीकी सहा. स्टाफ ग्रुप ॥(3)
सुश्री ज्ञान मदान	सहायक (वि. एवं ले.) ग्रेड ।		

भंडार एवं क्रय में कार्यरत स्टाफ

नाम	पदनाम	नाम	पदनाम
श्री अशोक कुमार मित्तल	भंडार एवं क्रय नियंत्रक	श्री दिनेश कुमार वर्मा	सहायक (भं. एवं क्रय) ग्रेड ।
श्री अमर नाथ शर्मा	उप भंडार एवं क्रय अधिकारी	श्री रईस अहमद	सहायक (भं. एवं क्रय) ग्रेड ॥
श्री दिनेश कुमार	उप भंडार एवं क्रय अधिकारी	श्री कमलेश कुमार	सहायक (भं. एवं क्रय) ग्रेड ॥
श्री एम एस गिल	सहायक (भं. एवं क्रय) ग्रेड ।	श्री राजिन्द्र कुमार	सहायक (भं. एवं क्रय) ग्रेड ॥
श्री बी के भटनागर	सहायक (भं. एवं क्रय) ग्रेड ।	सुश्री रानी हीरा	सहायक (भं. एवं क्रय) ग्रेड ॥
श्री रमेश कुमार गांधी	सहायक (भं. एवं क्रय) ग्रेड ।	श्री बैजनाथ	फराश
श्री कपिल वर्मा	वरि. आशुलिपिक	श्री अजीत सिंह	तकनीकी सहा. स्टाफ ग्रुप ॥(4)
सुश्री सुरिन्द्र कौर	सहायक (भं. एवं क्रय) ग्रेड ।	श्री सरदार सिंह	तकनीकी सहा. स्टाफ ग्रुप ॥(4)
श्री दुर्गा दत्त शर्मा	सहायक (भं. एवं क्रय) ग्रेड ।	श्री पहल सिंह	तकनीकी सहा. स्टाफ ग्रुप ॥(3)

अन्य सम्बद्ध संवाओं में कार्यरत स्टाफ

नाम	पदनाम	नाम	पदनाम
डॉ. पी. चक्रवर्ती	चिकित्सा अधिकारी गुप III(6)	श्री शोभा राम	रिकॉर्ड कीपर
श्री जे डी शर्मा	बागवानी अधीक्षक गुप III(6)	श्री राम अवतार शर्मा	सहायक (सा.) ग्रेड III
सुश्री मरियम्मा जॉर्ज	नर्सिंग सिस्टर गुप III(5)	श्री हाकम सिंह	सुरक्षा गार्ड
श्री एच एस गिल	सुरक्षा अधिकारी	श्री कुलवंत सिंह	सुरक्षा गार्ड
श्री लखपत राय	वरि. सुरक्षा सहायक	श्री दर्शन कुमार	सुरक्षा गार्ड
श्री राय सिंह	वरि. सुरक्षा सहायक	श्री करतारा	सुरक्षा गार्ड
सुश्री विजयम्मा उन्निकृष्ण	तकनीशियन गुप II(4)	श्री फकीरिया	सुरक्षा गार्ड
श्री करनैल	माली गुप I(4)	श्री राम अवतार (जूनि.)	सुरक्षा गार्ड
श्री सुखदेव	माली गुप I(4)	श्री तरसेम सिंह	सुरक्षा गार्ड
श्री अजुध्या प्रसाद	माली गुप I(4)	श्री हरभजन सिंह	सुरक्षा गार्ड
श्री सुजाउद्दीन	माली गुप I(4)	श्री दीना नाथ	सुरक्षा गार्ड
श्री राम लखन	तक. सहा. स्टाफ (माली) गुप I(4)	श्री कुलदीप सिंह	सुरक्षा गार्ड
श्री कन्हई	तक. सहा. स्टाफ (माली) गुप I(3)	श्री गुरबचन सिंह (जूनि.)	सुरक्षा गार्ड
सुश्री चिन्ना पोन्नु	तक. सहा. स्टाफ (माली) गुप I(3)	श्री रणधीर सिंह	सुरक्षा गार्ड
श्री संदीप कुमार	फार्मासिस्ट गुप II(1)	श्री बनारसी दास	सुरक्षा गार्ड
सुश्री दर्शनी देवी	तकनीकी सहा. स्टाफ गुप I(2)	श्री मोहन लाल	सुरक्षा गार्ड
श्री कांति राम	हलवाई	श्री करतार चन्द	सुरक्षा गार्ड
श्री दया राम	कुक (एसीपी)	श्री जसविन्दर सिंह	सुरक्षा गार्ड
श्री कुलवंत सिंह	काउंटर क्लर्क (एसीपी)	श्री वरिन्दर शर्मा	सुरक्षा गार्ड
श्री हर्षपति	कूपन क्लर्क (एसीपी)	श्री रोहताश	कैटीन सफाईवाला (एसीपी)
श्री मान सिंह	अतिथि गृह सहायक	सुश्री कैलाशी देवी	वाँश गर्ल (एसीपी)
श्री रामजी दास	कनि. सुरक्षा सहायक	सुश्री कादम्बरी	बीयरर
श्री छोटे लाल यादव	कनि. सुरक्षा सहायक	श्री दूलो राम	चौकीदार
श्री बीर सिंह	बीयरर (एसीपी)	श्री प्रेम चन्द	चौकीदार
श्री काली चरण	बीयरर (एसीपी)	श्री रमेश चन्द	चौकीदार
श्री रणजीत सिंह	बीयरर (एसीपी)	श्री राजिन्द्र सिंह	कुक
श्री विजय सिंह	बीयरर (एसीपी)	श्री सुनील कुमार	सफाईवाला
श्री दौलत सिंह	टी मेकर (एसीपी)	श्री धर्मजीस्टर	चौकीदार
श्री खेम चन्द	सफाईवाला (एसीपी)		

वर्ष 2004 - 05 के दौरान पदोन्नति प्राप्त कर्मियों की सूची

क्र.सं.	नाम	वर्तमान गुप (ग्रेड)	तिथि
1.	डॉ. राम प्रकाश बाजपेयी	वैज्ञानिक गुप IV(7)	01.06.2004
2.	डॉ. गौतम मित्रा	वैज्ञानिक गुप IV(6)	31.01.2001
3.	श्री पी के गोयल	वैज्ञानिक गुप IV(5)	31.03.2002
4.	डॉ. ललित एम भारद्वाज	वैज्ञानिक गुप IV(5)	01.04.2002
5.	श्री सुभाष सी जैन	वैज्ञानिक गुप IV(5)	20.04.2002
6.	श्री एच के पीर	वैज्ञानिक गुप IV(5)	01.02.2003
7.	डॉ. एच के सरदाना	वैज्ञानिक गुप IV(5)	27.12.2002
8.	श्री आर देवराजन	वैज्ञानिक गुप IV(4)	01.02.2003
9.	श्री के पी चौधरी	वैज्ञानिक गुप IV(3)	04.02.1999
10.	श्री संजीव वर्मा	वैज्ञानिक गुप IV(2)	01.01.2003
11.	श्री ए रोबर्ट सैम	वैज्ञानिक गुप IV(2)	30.03.2003
12.	श्री एच एस छगगर	तकनीकी अधिकारी गुप III(6)	01.12.2000
13.	सुश्री मीनालोचनी चंदर	तकनीकी अधिकारी गुप III(6)	01.02.2002
14.	श्री लाल सिंह	तकनीकी अधिकारी गुप III(6)	07.02.2002
15.	श्री नकली राम	तकनीकी अधिकारी गुप III(6)	01.08.2002
16.	सुश्री ललिता टंडन	तकनीकी अधिकारी गुप III(6)	01.02.2003
17.	श्री चंद्र मोहन	तकनीकी अधिकारी गुप III(5)	01.07.1999
18.	सुश्री जसजीत कौर	तकनीकी अधिकारी गुप III(5)	01.02.2001
19.	श्री गुरदयाल	तकनीकी अधिकारी गुप III(5)	01.06.2001
20.	श्री गुरशरण सिंह	तकनीकी अधिकारी गुप III(5)	01.08.2001
21.	श्री पृथ्वी राज	तकनीकी अधिकारी गुप III(5)	26.09.2001
22.	श्री अश्विनी कुमार	तकनीकी अधिकारी गुप III(5)	30.12.2001
23.	सुश्री शशि शर्मा	तकनीकी अधिकारी गुप III(5)	06.02.2002
24.	श्री सत्येन्द्र कुमार चौधरी	तकनीकी अधिकारी गुप III(5)	08.09.2002
25.	श्री ए के शर्मा	तकनीकी अधिकारी गुप III(5)	03.11.2002
26.	सुश्री आशा कुमार	तकनीकी अधिकारी गुप III(5)	01.02.2003
27.	श्री राधे श्याम	तकनीकी अधिकारी गुप III(5)	21.03.2003
28.	श्री के श्रवण कुमार	तकनीकी अधिकारी गुप III(4)	20.04.1999
29.	डॉ. एस जी शर्मा	तकनीकी अधिकारी गुप III(4)	24.02.1998
30.	श्री बी एस आहलुवालिया	तकनीकी अधिकारी गुप III(4)	11.12.1998
31.	श्री संजय शर्मा	तकनीकी अधिकारी गुप III(4)	24.05.2001
32.	श्री जी सी पोद्दार	तकनीकी अधिकारी गुप III(4)	01.02.2002

वर्ष 2004 - 05 के दौरान पदोन्नति प्राप्त कर्मियों की सूची

क्र.सं.	नाम	वर्तमान गुप (ग्रेड)	तिथि
33.	श्री पी के शर्मा	तकनीकी अधिकारी गुप III(4)	01.02.2002
34.	सुश्री मोनिका सिंगला	तकनीकी अधिकारी गुप III(4)	31.03.2002
35.	श्री मेहर चंद	तकनीकी अधिकारी गुप III(3)	03.04.2002
36.	श्री डी एस आनंद	तकनीकी अधिकारी ओल्ड (7)	08.12.1998
37.	श्री सीता राम	तकनीकी अधिकारी ओल्ड (6)	28.11.2001
38.	श्री धनवंत सिंह	तकनीकी अधिकारी ओल्ड (6)	25.02.2003
39.	श्री संतोख सिंह	तकनीकी अधिकारी ओल्ड (5)	10.07.2001
40.	सुश्री आइ के बालिया	तकनीकी अधिकारी ओल्ड (5)	26.09.2001
41.	श्री सुरजीत सिंह	तकनीकी अधिकारी ओल्ड (5)	31.03.2002
42.	श्री ए के मेदीरत्ता	तकनीकी अधिकारी ओल्ड (5)	30.04.2002
43.	श्री रतन सिंह	डाईवर गुप II (4)	01.01.2003
44.	श्री देस राज	डाईवर गुप II (4)	01.01.2003
45.	श्री हरमेश लाल	तकनीशियन गुप II (4)	01.04.2002
46.	श्री सुरिन्दर मोहन	तकनीशियन गुप II (4)	01.04.2002
47.	श्री अमर नाथ	तकनीशियन गुप II (4)	01.04.2002
48.	श्री बाबू लाल	तकनीशियन गुप II (4)	01.04.2002
49.	श्री के के चमोली	तकनीशियन गुप II (4)	01.04.2002
50.	श्री अशोक कुमार सोबती	तकनीशियन गुप II (4)	01.04.2002
51.	श्री सरदूल सिंह	तकनीशियन गुप II (4)	01.04.2002
52.	श्री धर्म सिंह	डाईवर गुप II (4)	03.04.2002
53.	श्री रेशम लाल	तकनीशियन गुप II (4)	07.04.2002
54.	श्री राम भज धीमन	तकनीशियन गुप II (4)	16.05.2002
55.	श्री बृज मोहन सूद	तकनीशियन गुप II (4)	03.07.2002
56.	श्री प्रीतम सिंह	तकनीशियन गुप II (4)	10.07.2002
57.	श्री रमेश चन्द्र	तकनीशियन गुप II (4)	18.07.2002
58.	श्री कुलवंत सिंह	तकनीशियन गुप II (4)	21.10.2002
59.	श्री जंग बहादुर	तकनीशियन गुप II (4)	26.12.2002
60.	श्री अमर सिंह	डाईवर गुप II (4)	01.02.2003
61.	श्री तारा चंद	तकनीशियन गुप II (4)	01.01.2003
62.	श्री मनी राम	तकनीशियन गुप II (4)	01.01.2003
63.	श्री जलील अहमद	तकनीशियन गुप II (4)	01.01.2003
64.	श्री जागीर सिंह	तकनीशियन गुप II (4)	13.05.2003

वर्ष 2004 - 05 के दौरान पदोन्नति प्राप्त कर्मियों की सूची

क्र.सं.	नाम	वर्तमान गुप (ग्रेड)	तिथि
65.	श्री हरचंद सिंह	तकनीशियन गुप ॥ (4)	01.06.2003
66.	श्री सतपाल	तकनीशियन गुप ॥ (4)	07.06.2003
67.	श्री प्रेम नाथ	तकनीशियन गुप ॥ (4)	07.06.2003
68.	सुश्री विजयम्मा उन्निकृष्णन	तकनीशियन गुप ॥ (4)	13.06.2003
69.	श्री जोगिंदर सिंह	तकनीशियन गुप ॥ (4)	01.07.2003
70.	श्री सीता राम	तकनीशियन गुप ॥ (4)	29.12.2003
71.	श्री दया राम	तकनीशियन गुप ॥ (4)	29.12.2003
72.	श्री ज्ञान चंद रूहानी	तकनीशियन गुप ॥ (4)	29.12.2003
73.	श्री आर डी शर्मा	तकनीशियन गुप ॥ (4)	29.12.2003
74.	श्री वी के बंसल	तकनीशियन गुप ॥ (4)	29.12.2003
75.	श्री जी के माथुर	तकनीशियन गुप ॥ (4)	29.12.2003
76.	श्री सतीश कुमार	तकनीशियन गुप ॥ (3)	29.12.1997
77.	सुश्री ललिता शर्मा	तकनीशियन गुप ॥ (3)	23.01.2000
78.	श्री पवन कुमार	तकनीशियन गुप ॥ (3)	14.02.2000
79.	श्री प्रेम राज	तकनीशियन गुप ॥ (3)	06.11.2000
80.	श्री अजय कुमार सक्सेना	तकनीशियन गुप ॥ (3)	01.01.2003
81.	श्री अशोक कुमार	तकनीशियन गुप ॥ (3)	01.01.2003
82.	श्री मोहन सिंह	तकनीशियन गुप ॥ (3)	21.09.2003
83.	श्री बलवंत सिंह	तकनीशियन गुप ॥ (3)	22.09.2003
84.	श्री दिलबाग सिंह	डाईवर गुप ॥ (2)	18.02.2004
85.	सुश्री चमेली रानी	तकनीकी सहायक स्टाफ गुप I (4)	18.09.2002
86.	श्री पी वेल्मनिककम	तकनीकी सहायक स्टाफ गुप I (4)	01.10.2003
87.	श्री ए के मुखर्जी	प्रशासनिक अधिकारी	22.04.2004
88.	सुश्री नीरू	वरिष्ठ हिन्दी अधिकारी	08.02.2005
89.	श्री दिनेश कुमार	उप भंडार एवं क्रय अधिकारी	07.02.2005
90.	श्री दया नंद	सहायक (सा.) ग्रेड I	31.03.2005
91.	श्री वरयाम सिंह	सहायक (सा.) ग्रेड I	31.03.2005
92.	श्री राजिंदर कुमार	सहायक (भं. एवं क्रय) ग्रेड II	31.03.2005
93.	सुश्री रानी हीरा	सहायक (भं. एवं क्रय) ग्रेड II	31.03.2005
94.	श्री मनोज कुमार	सहायक (सा.) ग्रेड II	31.03.2005
95.	श्री बृज मोहन	सहायक (सा.) ग्रेड II	31.03.2005
96.	श्री तरसेम लाल	रिकार्ड कीपर	02.04.2004

**वर्ष 2004 - 05 के दौरान सीएसआइओ में नव - नियुक्त /स्थानांतरण
पर कार्यभार ग्रहण करने वाले कर्मियों की सूची**

क्र.सं.	नाम	पदनाम	तिथि
1.	श्री जगवीर सिंह	वैज्ञानिक गुप IV(1)	05.04.2004
2.	श्री अलोक कुमार मुखर्जी (सीएसआइआर, नई दिल्ली से सीएसआइओ, चण्डीगढ़ - पदोन्नति पर)	प्रशासनिक अधिकारी	22.04.2004
3.	श्री कीमती लाल (सीएसआइआर कॉम्प्लैक्स, नई दिल्ली से सीएसआइओ, चण्डीगढ़ - स्थानांतरण पर)	अनुभाग अधिकारी (सा.)	05.05.2004
4.	श्री अरिंदम चटर्जी	वैज्ञानिक गुप IV(1)	20.05.2004
5.	श्री विधु शेखर पाण्डेय	वैज्ञानिक गुप IV(1)	21.06.2004
6.	श्री अशोक कुमार मित्रल (निस्केयर, नई दिल्ली से सीएसआइओ, चण्डीगढ़ - स्थानांतरण पर)	भंडार एवं क्रय नियंत्रक	28.06.2004
7.	सुश्री मनिका बेदी	तकनीकी सहायक स्टाफ गुप I(1)	20.07.2004
8.	श्री अतुल सेठी	सहायक (सा.) ग्रेड III	12.08.2004
9.	श्री सोहन सिंह	सहायक (वित्त एवं लेखा) ग्रेड III	23.08.2004
10.	श्री संदीप सिंघई	वैज्ञानिक गुप IV(1)	16.09.2004
11.	डॉ. पवन कपूर	निदेशक, सीएसआइओ	15.10.2004
12.	श्री दिनेश कुमार वर्मा	सहायक (भं. एवं क्रय) ग्रेड I	08.12.2004
13.	श्री हरीश कुमार	सहायक (सा.) ग्रेड I	13.12.2004
14.	श्री दिनेश कुमार	उप भं. एवं क्रय अधिकारी	07.02.2005
15.	श्री उमेश कुमार यादव	सहायक (सा.) ग्रेड I	28.02.2005
16.	श्री सुधांशु शेखर राय	सहायक (सा.) ग्रेड I	02.03.2005

**वर्ष 2004 - 05 के दौरान सीएसआइओ से सेवानिवृत्त होने /
स्वैच्छिक सेवानिवृत्ति लेने वाले कर्मियों की सूची**

क्र.सं.	नाम	पदनाम	तिथि
1.	श्री सुरिन्दर कुमार	तकनीशियन गुप II(4)	30.04.2004
2.	श्री मोहिन्दर सिंह	तकनीशियन गुप II(4)	30.04.2004
3.	श्री सीता राम	सुरक्षा गार्ड (एसीपी)	30.04.2004
4.	श्री बलविन्दर सिंह	तकनीकी अधिकारी गुप III(6)	30.04.2004
5.	श्री करनैल सिंह	तकनीशियन गुप II(4)	31.05.2004

क्र.सं.	नाम	पदनाम	तिथि
6.	श्री बलदेव राज कक्कड़	वैज्ञानिक ग्रुप IV(4)	30.06.2004
7.	श्री आर एस सचदेवा	तकनीकी अधिकारी ओल्ड (5)	30.06.2004
8.	श्री आर के अग्रवाल	वैज्ञानिक ग्रुप IV(3)	31.07.2004
9.	श्री ए के गंजू	वैज्ञानिक ग्रुप IV(5)	31.08.2004
10.	श्री कुलदीप सिंह	तकनीकी अधिकारी ग्रुप III(6)	31.08.2004
11.	सुश्री मोहना राममूर्ति	वैज्ञानिक ग्रुप IV(5)	30.09.2004
12.	श्री देवदत्त शर्मा	तकनीकी अधिकारी ओल्ड(5)	30.09.2004
13.	श्री जगदीश सिंह	सुरक्षा गार्ड	31.10.2004
14.	श्री एस एस भल्ला	तकनीकी अधिकारी ओल्ड (5)	30.11.2004
15.	श्री के के चमोली	तकनीशियन ग्रुप II(4)	30.11.2004
16.	श्री दया राम	माली ग्रुप I(4)	31.12.2004
17.	श्री हरिंदर सिंह	तकनीकी अधिकारी ग्रुप III(3)	13.01.2005
18.	डॉ. ए के अग्रवाल	वैज्ञानिक ग्रुप IV(6)	31.01.2005
19.	श्री महान सिंह	सुरक्षा गार्ड	31.01.2005
20.	श्री के एल कपूर	तकनीकी अधिकारी ओल्ड (5)	28.02.2005
21.	श्री सुरेन्द्र सिंह	तकनीशियन ग्रुप II(4)	28.02.2005
22.	श्री बृज मोहन सूद	तकनीशियन ग्रुप II(4)	28.02.2005
23.	सुश्री रजनी भारद्वाज	स. प्रबंधक कैटीन (एसीपी)	03.03.2005
24.	डॉ. एम एस एन श्रीनिवास	वैज्ञानिक ग्रुप IV(4)	12.03.2005
25.	श्री तारा चंद	तकनीशियन ग्रुप II(4)	31.03.2005
26.	श्री रमेश चंद	तकनीशियन ग्रुप II(4)	31.03.2005
27.	श्री हुकम सिंह	रिकॉर्ड कीपर	31.03.2005

वर्ष 2004 - 05 के दौरान सीएसआइओ, चण्डीगढ़ से स्थानांतरित होने वाले कर्मियों की सूची

क्र.सं.	नाम	पदनाम	तिथि
1.	सुश्री सूफिया किरमानी (सीएसआइओ, चण्डीगढ़ से सीमैप, लखनऊ)	सहायक (सा.) ग्रेड I	08.04.2004
2.	श्री पी सी सगोत्रा (सीएसआइओ, चण्डीगढ़ से सीमैप, लखनऊ)	व. भंडार एवं क्रय अधिकारी	18.06.2004
3.	सुश्री मीना कुमारी (सीएसआइओ, चण्डीगढ़ से आइआइपी, देहरादून)	सहायक (भं. एवं क्रय) ग्रेड I	30.11.2004
4.	श्री विमल कुमार (सीएसआइओ, चण्डीगढ़ से एनपीएल, नई दिल्ली)	सहायक (भं. एवं क्रय) ग्रेड I	31.01.2005

वर्ष 2004 - 05 के दौरान सीएसआइओ, चण्डीगढ़ में त्यागपत्र देने वाले कर्मियों की सूची

क्र.सं.	नाम	पदनाम	तिथि
1.	सुश्री टीना बहल	वैज्ञानिक ग्रुप IV(1)	04.06.2004
2.	श्री उपेश जिंदल	वैज्ञानिक ग्रुप IV(1)	21.07.2004
3.	श्री राकेश पांगटे	वैज्ञानिक ग्रुप IV(1)	20.08.2004
4.	श्री प्रमोद कुमार सिंह	वैज्ञानिक ग्रुप IV(1)	20.08.2004
5.	सुश्री मनिका बेदी	तकनीकी सहायक स्टाफ ग्रुप I(1)	08.10.2004
6.	श्री जे. टी. एस. अरूण कुमार	वैज्ञानिक ग्रुप IV(1)	01.11.2004
7.	श्री रमन कुमार अत्री	वैज्ञानिक ग्रुप IV(2)	20.01.2005

श्रद्धांजलि

क्र.सं.	नाम	पदनाम	तिथि
1.	श्री नत्थू राम	वॉश बॉय (एसीपी)	29.09.2004
2.	श्री डी. एस. आनंद	तकनीकी अधिकारी ओल्ड(7)	04.02.2005

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