

CSIR in Media



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CSIR-CSIO, Chandigarh Transfer Technology of Military Aviation Head Up Display test Platform to BEL, Panchkula

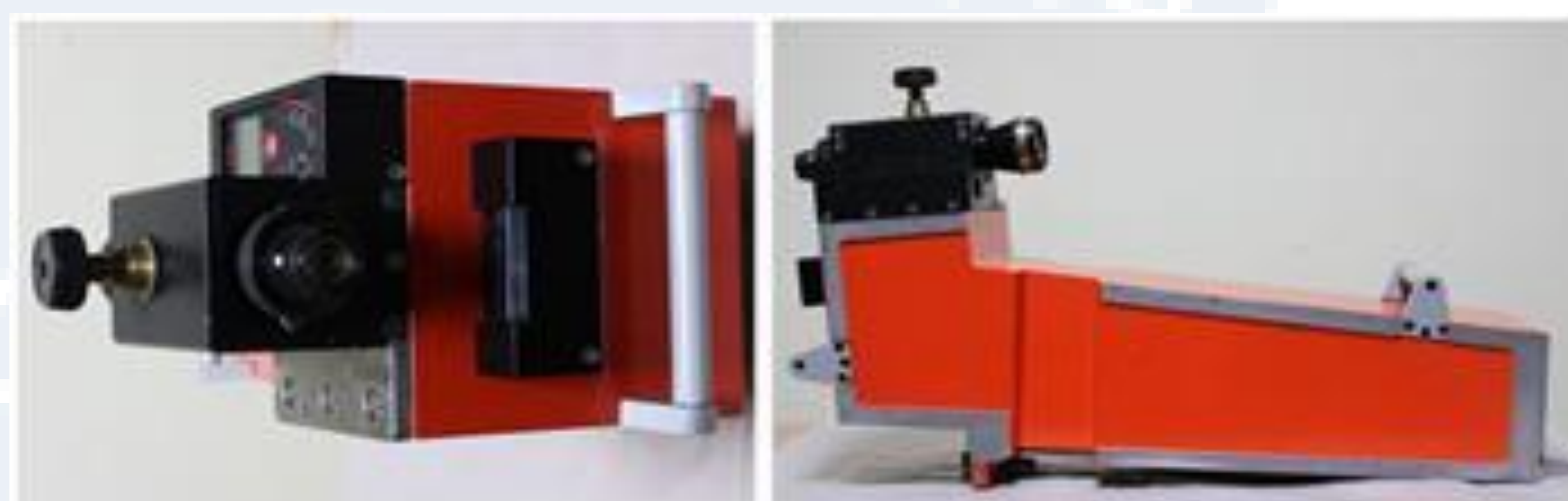
CSIR-CSIO

18th December 2017



Now the CSIR's Chandigarh based National Laboratory CSIR-CSIO has come up with the Indigenisation of "Aviation Cockpit Display Validation Platform - ACDVP" comprising Bore Sighting System and Military Head Up Display Test Platform (MAHTP), which provides optical harmonization, complete optical and electrical functional testing of Head Up Display Variants, Optical Display Units, Gun Sights, Bore Sighting Tool for Laser Ranger & Marked Target Seeker, etc.

CSIR-CSIO has been pioneer in design and development of aircraft displays with variants of Head Up Displays (HUD), the prime flight display responsible for displaying aircraft, flight, navigation, target and weapon information to the aircraft pilot in forward view superimposed on the forward scene viewed by the pilot, developed namely HUD Mk1, HUD Mk1N, HUD Mk1-NP, HUD H Series for Light Combat Aircraft (LCA) Air Force, Tejas Navy, Naval LCA Prototype and the Intermediate Jet Trainer Aircrafts, respectively. Development of these vital equipment has been an achievement placing India in select list of countries capable of such a complex technology.



for fighter aircrafts (fixed and rotary wing) for pre-flight clearance, post-flight analytics, testing and calibration as well as for military ground based optical displays. It facilitates harmonization of Head Up Display, Optical Sights, Holographic Optical Sights, Gun Sights and Optical Displays with aircraft or desired axis for harmonization error correction within 1mR. The MAHTP provide pre and post-flight detailed functional checks at Intermediate and Operator Level and post-flight analytics and diagnostics at Depot level. Due to the flexibility in design and modular configuration of the Aviation Cockpit Display Validation Platform, which is essentially a ground equipment meant for usage by Air Force, Army and Navy, the design can be customized to any aircraft platform. Further, there are various innovative features that have been embedded in the technology making the technology strategically relevant to Indian Airforce, Aviation Wings of Navy and Army, Production Agencies and the Maintenance Staff.

The technology of Military Aviation Head Up Display Test Platform (MAHTP), transferred today to Bharat Electronics Limited, Ministry of Defence, Panchkula for its licensed production, is meant for Air Force and Aviation Wings of Navy and Army at Intermediate Level (I-Level), Operator Level (O Level) and Depot (D) Level for Airforce Base Station, Aircraft Manufacturing Agency and Manufacturing Agency's Site, respectively. The comprehensive aviation test platform provides visual inspection, system health monitoring through communication, automated testing, fault debugging, repair and maintenance at system level, semi-automated evaluation of optical parameters like parallax error, binocular disparity, photometric characteristics, field of view, camera, etc, and calibration. The Bore Sighting System (BSS), an opto-mechatronic aircraft ground equipment which has been certified by the Regional Centre for Military Airworthiness Chandigarh (a body of DRDO – Centre for Military Airworthiness & Certification), is used to install and harmonize head up displays, optical displays and cockpit displays at the desired position in the aircraft cockpit with reference to the aircraft axis (Fuselage Reference Line) ensuring harmonisation within 1mR. Its indigenization has saved several crores of foreign currency the smaller industries.

and its modular configuration provides an option to customize the design further for any aircraft platform. Its technology is under licensed production at Bharat Electronics Limited, Ministry of Defence, Panchkula. The key advantage which the innovative technology of Bore Sighting System provides is the harmonisation accuracy of 1mR for a target distance of 60m achieved through the design of telescope optics, precision mechanical assembly along with fine motorized control and alignment of both axes within 6 secs, meaning thereby that the target positioning through head up display and optical display units would be within 10 feet for a distance of 10 kms. The technology of MAHTP ensures accurate and repeatable parallax measurements within 6 secs for horizontal movement of 200 mm and 100 mm of vertical movement, and Positional accuracy measurements in single setup within 6 secs, Brightness measurements from 2fL to 20000fL for background varying from 0fL to 12000fL achieved through use of neutral density optical filters and customized motorised mounts and thus manage contrast ratio measurements, and Correction of geometric errors within the specified limits achieved through customised test patterns, measurement methodology, precision optical equipment used and the precision mechanical movements and assembly.

Bore Sighting System Military Head Up Display Test Platform

The MAHTP also enables Real time reporting of faults for isolation of faults in real time at components level, User friendly graphical user interface for programmable symbology and test pattern generation at various writing speeds with handshake and Simulation of head motion box achieved through precision x-y-z slide movement. In addition, MAHTP also facilitates pre and post flight analytics, clearance and harmonisation. By its construction and versatile configurable design, it can also be used to test, validate and calibrate Gun Sights, Bore Sighting Tool for Laser Ranger & Marked Target Seeker (LRMTS) & SPA Payloads, etc. Due to its modular configuration of BSS and MAHTP, the system design can be configured to any aircraft platform with customized specifications based on the end application of the defence forces.

If we compare pre-deployment with post-deployment scenario, the technologies of MAHTP and BSS provide end-to-end solution for a complex technology of HUD, Cockpit and Opto-electronic Displays. Such kind of systems are provided by the International manufacturers customized for each aircraft platform with limited features in terms of optical and electrical testing and calibration. The comparisons of the developed technologies of MAHTP and BSS with other international peers show that presently, the scope of optical evaluation is limited with non-availability of optical measurements like parallax error, binocular disparity, symbol positioning accuracy, linearity, field of view, photometric, line width, ghost images measurements, etc. to Indian Defence Forces. The indigenisation of such complex technological solution not only facilitates automated testing at LRU Level, module and sub-module levels as well as component Level but also created possibility of customization of such technological features at competitive price and with globally competitive features for multiple aircraft platforms and military ground applications. Development of this technology package will also help in establishing self-reliance in strategic sector and is in line with GoI's 'Make in India' and 'Innovate in India' initiative. Each aircraft squadron would require one set of MAHP and BSS and hence an estimated FOREX saving of about Rs50 Crores per aircraft type is estimated and its production will provide ample revenue generating opportunities to

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Also published in:

The Times of India, The Indian Express,
The Tribune, Hindustan Times

Plastic waste can be used for decontamination of water

CSIR-IITR

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This newly developed low-cost magnetic nanomaterial has the adsorptive potential for cephalexin from the water

Now scientists have formulated an effective strategy of upcycling polyethylene terephthalate (PET) waste into a functional material to mitigate another critical environmental problem - the emerging levels of antibiotics in water. "We collected PET refuse from the surroundings and converted the same into a magnetically responsive carbon nano-material by carbonization and activation of the PET char under controlled conditions and magnetic modification by a simple chemical precipitation route," explained Dr Rai. Extensive use and disposal of pharmaceuticals in the environment is leading to its contamination and increasing antibiotic resistance. Widely used antibiotic, Cephalexin, is detected as micropollutant in the environment. " This newly developed low-cost magnetic nanomaterial has the adsorptive potential for cephalexin from the water. The minimal adsorbent dose of 0.4 gram per liter could remove greater than half of the initial

Recycling is the only option to handle plastic waste at present. Now Indian scientists have found a new use for plastic waste - for decontamination of water. Dr. Premanjali Rai and Dr. Kunwar P. Singh from Environmental Chemistry Division, CSIR - Indian Institute of Toxicology Research, Lucknow have used plastic waste to develop a low-cost magnetically responsive adsorbent material which can be used to remove an antibiotic cephalexin from water. The indiscriminate burning of plastic results in emission of deadly gases and carcinogens into the environment. Dumping them in landfills results in leaching of toxins into ground and surface water resources.

cephalexin concentration under laboratory conditions. This technique of magnetic separation for spent adsorbent decreases the secondary pollution problems associated with the non-magneto active adsorbents," said Dr Rai.

The newly developed adsorbents have considerable desorption potential and can be reused. These advantages make it an efficient adsorbent for removal of emerging micropollutants. These findings will prompt to develop more innovative strategies for non-biodegradable waste management.

This work has been published in the *Journal of Environmental Management*. The research team included Dr Premanjali Rai and Dr. Kunwar P. Singh, Environmental Chemistry Division, CSIR - Indian Institute of Toxicology Research, Lucknow. (**India Science Wire**)

Published in:
[Down to Earth](#)

Natural composite for stronger bone grafts

CSIR-NML

18th December 2017



Subhadra Garai (left) and Chandrani Sarkar have developed a material for regenerative bone graft.

The strength and elasticity matches that of cancellous and cortical bone

A novel nanocomposite developed by researchers from CSIR-National Metallurgical Laboratory (CSIR-NML) has shown potential to be used as a regenerative bone graft especially in regions which need high strength. The nanocomposite was synthesised through a simple and cost-effective route. The composite contains carboxymethyl cellulose, gelatin and hydroxyapatite, with the hydroxyapatite in nanoscale (25-10 nm size). The bone graft to be used in load-bearing application must match the strength of the natural bone. So the researchers evaluated the strength and

elasticity of the nanocomposite and found it to be in the same range as human cancellous and cortical bone. "All bone grafts need to be steam sterilised before use. So it is essential that the substance can withstand at least 120 degree C. Our new polymer nanocomposite is thermally stable up to 200 degree C. It is biodegradable and also accelerates the formation of new bone apatite under simulated body fluid," explains Chandrani Sarkar, PhD scholar at the institute and first author of the paper published in *Journal of Material Science*.

In vitro studies

They also examined the biocompatibility and proliferation of the human bone cell line (MG-63) cells in the presence of the nanocomposite. The human cells were found attached and had spread well on the surface of the nanocomposite indicating that they were well suited for cell growth and proliferation. They also observed that the nanocomposite accelerated the bone cell

line for new bone tissue formation. *In vivo* tests need to be carried out to get a full understanding of the nanocomposite. There are several options available for replacement of damaged/diseased bones such using patient's own bone, donor's bone and metallic implants.

The risk of transferring diseases and chances of biological rejection from host body are very high in the case of bones transplanted from others (allo-graft). Metallic implants have high mechanical strength and mismatch with natural bone causing stress shielding and bone loosening which may damage or fracture adjacent bones.

“The compressive strength and modulus of our nanocomposite is in the range of human bone. So there is no risk of damage to adjacent bones after implantation. Importantly, the nanocomposite has regenerative property, with time it will be absorbed inside the body and new bone will be formed in that place. Unlike metallic implants, there is no need to take out our implants,” explains Sarkar in an e-mail to *The Hindu*.

“We have already transferred know-how to industry and they are using our products,” says Prof. Subhadra Garai, senior scientist and corresponding author at the Advanced Materials and Processing Division, CSIR-NML.

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[The Hindu](#)

MAHAGAMS to provide machinery and ash to SHGs: Wardhane

CSIR-NEERI

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Business Bureau,

In January 2016, MoEF&CC has issued notification stipulating 100% utilisation of fly ash by December 31; however during the H1 of 2016-17, the utilisation of fly ash was only 58%

The conference on fly ash utilisation started at Dr Ambedkar Auditorium, Dekshabhoomi on Friday. The conference was inaugurated by Anoop Kumar, Divisional Commissioner.

Also present were R B Goenka, power expert, Shyam Wardhane, Managing Director of MAHAGENCO Ash Management Services Ltd (MAHAGAMS), Prabhakar Kukde, former Director MSEB, Tata Power, A D Palamwar, former Director, MSEB, Abhay Harne, Chief Engineer KTPS MAHAGENCO, Koradi, Rajkumar Taskar, Chief Engineer of KTPS MAHAGENCO Koradi, Rajesh Patil, Chief Engineer of Khaperkheda Thermal Power Station, Suhas Markandeya, Secretary of Rajeev Gandhi Science and Technology Commission, GoM, Mathurkar, CEO of MAHAGAMS, Nitin Wagh, CGM of

Environment and Safety, head office, MAHAGENCO, Mumbai, Shekhar Ameen, technical advisor to Energy Minister GoM, Dr Rayalu, representative from NEERI, Jayant Pathak from Fortune Foundation. The conference is jointly convened by Green Ash Foundation, Fortune Foundation and YAHVI Foundation. The conference aims to promote the use of fly ash and find out innovative ways to use ash in various sectors like infrastructure, building materials, mine filling etc. This unique initiative is taken in accordance with Maharashtra State Fly Ash Policy adoption. Sudhir Paliwal, expert member of Maharashtra State Fly Ash Council briefed about the initiatives.

It could be noted that India has vast coal reserve of 211 billion tonne making coal the most extensively used fossil fuel for generating power in the country. In order to achieve self-sufficiency in energy sector, Government of India has announced ambitious targets for domestic coal production of 1500 million tonne coal per annum by 2020 out of which 900 million tonne (60%) coal is expected to be used for thermal power generation.

Ash is expected to be generated annually. Disposal of such a huge quantity is a big challenge as it requires large area of land for constructing ash ponds and is also one of the major sources of air, water and land pollution in India. In January 2016 MoEF&CC has issued notification stipulating 100 per cent utilisation of fly ash by December 31; however during the first half of the year 2016-17, the utilisation of fly ash was only 58 per cent which just the half of the target. The day one of the conference saw presentation by Shyam Wardhane, Managing Director of MAHAGAMS. He gave a detailed presentation on the topic 'Fly Ash Utilisation Policy' of MAHAGENCO and opportunities for entrepreneurs in industrial cluster developed by MAHAGAMS. "Entrepreneurs willing to start fly ash based industry are most welcomed and various flexibility are offered to them to provide ease of doing business. MAHAGAMS will also provide machinery and ash to self-help groups (SHGs) so that they can have sustainable income sources," Wardhane said.

Various other presentations included detailed information on topic ‘Scenario of fly ash utilisation in India’ by V K Sinha, Executive Director of NPTI, ‘Role of regulatory authorities in implementation of MOEF and CC notifications’ by Dr Hema Deshpande of MPCB, ‘Maharashtra State Fly Ash Policy 2016’ by Sudhir Paliwal, expert member of Maharashtra State Fly Ash Council.

The other major presentations included ‘Project Funding for MSME’ by CA Chetan Khanolkar, ‘Production of Sodalite, Zeolite- A and Y from Fly Ash’ by Dr Sadhna Rayalu and Dr Avneesh Anshul, CSIR- NEERI, ‘Design of sustainable housing with fly ash’ by architect Deep M Dey of DEIGNFAKT.

The topic on funding for research was elaborated by Suhas Markandeya, RGSTC. ‘Innovative application of fly ash for thermo luminescence radiation dosimetry’ by Dr S J Dhoble, RTMNU.

An exhibition is organised which is showcasing fly-ash grinding and drying systems, fly ash sand plant designs, innovation in ash management etc. During the summit, students in large numbers from various engineering colleges are getting exposure to innovations in the field of fly ash utilisation.

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विदेशी दावों से भारतीय वैज्ञानिक सहमत नहीं

नई दिल्ली | एजेंसी

वैज्ञानिक एवं औद्योगिक अनुसंधान परिषद (सीएसआईआर) से जुड़े प्रसिद्ध वैज्ञानिक एवं भूगर्भशास्त्री डॉ. राजीव निगम ने रामसेतु के काल को लेकर अमेरिकी वैज्ञानिकों के दावों पर असहमति जताई है।

सीएसआईआर के राष्ट्रीय समुद्र विज्ञान संस्थान में सलाहकार एवं भूगर्भ विभाग के मुख्य वैज्ञानिक डॉ. निगम ने कहा कि रामसेतु के काल के बारे में विदेशी वैज्ञानिकों ने जो दावा किया है उस पर विस्तृत शोध की जरूरत है इसलिए यह कह पाना मुश्किल है कि सेतु कितना पुराना है। उन्होंने कहा कि अमेरिकी

रामसेतु पर राय

- विदेशी वैज्ञानिकों के दावे पर शोध की जरूरत : डॉ. निगम
- कहा, संभव नहीं कि पत्थर पहले के हों और रेत बाद की

वैज्ञानिक अपने निष्कर्षों में यह दावा कर रहे हैं कि रामसेतु के पत्थर सात हजार साल पुराने हैं जबकि वहां मौजूद रेत चार हजार वर्ष पुरानी है। लेकिन यह तर्क संगत नहीं लगता क्योंकि सेतुबंध का निर्माण बिना रेत के नहीं हुआ होगा। यह संभव नहीं लगता कि पत्थर पहले के हों और रेत बाद की।

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एनजीआरआई में नराकास हैदराबाद (3) की छमाही बैठक संपन्न

हैदराबाद, 14 दिसंबर (स्वतंत्र वार्ता)। नगर राजभाषा कार्यान्वयन समिति (कार्यालय), हैदराबाद (3) की दूसरी छमाही बैठक सीएसआईआर-एनजीआरआई, में आयोजित हुई। नराकास, हैदराबाद (3) के सदस्य कार्यालयों के कर्मचारियों ने बड़ी संख्या में भाग लिया। नराकास, हैदराबाद (3) के सदस्य सचिव चि.वें. सुब्बाराव ने सभी सदस्य कार्यालय प्रमुखों एवं हिन्दी पदाधिकारियों का स्वागत किया। डॉ. वीएम तिवारी, अध्यक्ष, नगर राजभाषा कार्यान्वयन समिति, हैदराबाद (3) एवं निदेशक, सीएसआईआर-एनजीआरआई ने इस बैठक की अध्यक्षता की। प्रत्येक बैठक में किसी एक सदस्य कार्यालय अध्यक्ष को मुख्य अतिथि बनाने के निर्णय के अनुसार क्षेत्रीय कर्मचारी भविष्यनिधि कार्यालय के क्षेत्रीय भविष्यनिधि आयुक्त बी. चन्द्रशेखर इस बैठक के लिए मुख्य अतिथि के रूप में पधारे। हिन्दी शिक्षण योजना, हैदराबाद से सहायक निदेशक डॉ. कौशल्या उपस्थित हुईं। अध्यक्ष ने अपने संबोधन के दौरान सदस्य कार्यालयों से अनुरोध किया कि



राष्ट्रीय उद्देश्य की पूर्ति के लिए सभी को मिलकर काम करना चाहिए। उन्होंने आगे कहा कि राजभाषा कार्यान्वयन सिर्फ राजभाषा कार्यान्वयन समिति के अध्यक्ष का ही जिम्मेदारी नहीं है। राजभाषा का सफल कार्यान्वयन स्वस्थ सहभागिता से ही हो पाएगा। उन्होंने राजभाषा पत्रिकाओं का प्रकाशन, राजभाषा संगोष्ठियों का आयोजन आदि बिन्दुओं पर महत्वपूर्ण सुझाव दिए। मुख्य अतिथि बी. चन्द्रशेखर ने कहा कि उनका कार्यालय चूँकि जनता से संबद्ध है, उन्हें हिन्दी,

अंग्रेजी के साथ-साथ स्थानीय भाषा में भी कार्य करता है। उन्होंने अपने कार्यालय के कार्य के बारे में उल्लेख किया कि वर्तमान में 69.03 लाख भविष्यनिधि खातों का रखरखाव और 97587 को पेंशन प्रदान कर रहा है। उन्होंने सभी से अपील की कि सभी मिलकर इस न.रा.का.स. को प्रथम स्थान पर लाएं। इससे पहले मुख्य अतिथि का परिचय समिति के सदस्य-सचिव चि.वें. सुब्बाराव ने दिया।

बैठक के दौरान सदस्य सचिव चि.वें. सुब्बाराव ने राजभाषा विभाग

द्वारा जारी वार्षिक कार्यक्रम तथा राजभाषा विभाग से प्राप्त पत्रों का विवरण दिया। तदुपरान्त सदस्य कार्यालयों से प्राप्त तिमाही प्रगति रिपोर्टों पर समीक्षा की गई। सदस्य सचिव ने सदस्य कार्यालयों से अनुरोध किया कि समय पर रिपोर्ट भेजें और सही से रिपोर्ट भरें। बैठक में उपस्थित सीएसआईआर-सीसीएमबी के निदेशक डॉ. आर.के. मिश्रा ने अपने विचार व्यक्त किए। बैठक सीएसआईआर-सीसीएमबी के वरि. हिन्दी अधिकारी आर. चन्द्रशेखर ने धन्यवाद ज्ञापन किया।

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छात्रों को बताया ऊर्जा संरक्षण का महत्व



रुड़की आईआईटी के इंस्टीट्यूट ऑफ इंजीनियर सभागार में प्रश्नोत्तरी प्रतियोगिता में सम्मानित किए गए मेधावी छात्र-छात्राएं।

रुड़की(ब्यूरो)। सीएसआईआर-सीबीआरआई और द इंस्टीट्यूट ऑफ इंजीनियर्स में बृहस्पतिवार को विश्व ऊर्जा संरक्षण दिवस मनाया। इसमें मुख्य वक्ता वैज्ञानिक अतुल अग्रवाल ने छात्रों को ऊर्जा संरक्षण के महत्व पर जानकारी दी। पहले सत्र में सीबीआरआई में छात्र-छात्राओं को विशेषज्ञों ने ऊर्जा पर व्याख्यान, वीडियो फिल्म, प्रयोगशालाओं का दौरा और वैज्ञानिकों से वार्तालाप के जरिए ऊर्जा से संबंधित महत्वपूर्ण मुद्दों, ऊर्जा संरक्षण की आवश्यकता, ऊर्जा दक्षता और ऊर्जा उपयोग में मितव्ययता पर जागरूक किया। दूसरे सत्र में द इंस्टीट्यूट ऑफ इंजीनियर्स में ऊर्जा संरक्षण विषय पर क्विज प्रतियोगिता आयोजित की। इसमें केंद्रीय विद्यालय-एक की मनीषा, शीतल, स्नेहा, वंदना, सिमरन की टीम प्रथम, कैंट बोर्ड की मयंक, दीपाली, सागर, प्रियांशु, काजल की टीम द्वितीय और दून पब्लिक स्कूल की साक्षी, तैमूर, फरदीन, आफिया, तारिक की टीम को तृतीय पुरस्कार दिया गया। इस अवसर पर डॉ. अचल मित्तल, डॉ अशरफ इक़बाल, रंजीत सिंह, इतरत, संदीप अग्रवाल, पीपी अग्रवाल उपस्थित रहे।

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