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समाचार

# ECIL NEWS LETTER

Volume 43 Issue 2

Quarterly

July 2012

## MPROGICON 5000 series *PLC*

*.....the launch of another indigenous product*



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**N**PR is picking up speed. India's first citizen got enrolled on 6<sup>th</sup> July 2012 at Rashtrapati Bhavan. ECIL is playing a pivotal role in this flagship scheme of Government of India. While NPR 57 is progressing at a brisk pace, NPR 40 has been also taken up by ECIL which spans UP (part), Bihar (part), Uttarakhand (part), Assam (part), Chattisgarh (part), Mizoram and J&K. This will be followed by NPR 20 covering MP (part), Sikkim, Haryana and Jharkhand. The additional business stands at Rs. 650 crores.

It is heartening to note that ECIL has added new advanced products to its portfolio. The new generation PLC is an indigenously built trusted platform that can be deployed in strategic projects. Information security is drawing the attention of end users and solution providers as net-centric operations are gaining popularity. ECIL has unveiled its ECR-1000 Series Carrier Ethernet Switch Router and Secure Network Access System (SNAS). These state-of-the-art products are being productionised with know-how from IIT, Mumbai and BARC respectively.

A large area imaging Cherenkov telescope MACE is being set up at Hanle, a high altitude astronomical site in Ladakh region of North India. The telescope will deploy a 21m diameter tracking light collector made up of diamond turned aluminum mirrors developed indigenously. ECIL has been entrusted with the responsibility of setting up the facility. The proof assembly is in progress near AP&SD. It will be another feather in ECIL's cap once the work at Hanle is completed.

The enthusiasm of Young Engineers was dominantly visible at the mini Auditorium, the venue for Technology Day celebrations on 11th May 2012. The hall was jam packed and the talks were heard with rapt attention. Shri N Saibaba, CE, NFC, who was the Chief Guest, delivered a talk on "Nuclear Energy-The Most Attractive Option" highlighting the advantages of Nuclear Power over Thermal etc which use fossil fuel. Our CMD's call for innovation and Indian Intellectual Property was well received and sure to have a lasting impression particularly on the younger minds. The Chief Guest released ECIL's R&D Report - 2012.

Shri Potluri Sudhakar is the new Director (Technical). He has a long experience in Nuclear and Defence sectors. ECIL and its customers can surely expect him to play a greater role in shaping the company as a leader in strategic electronics. ECIL News Letter wishes Shri Sudhakar great success in his new capacity as Director (Technical).

With Best Wishes,



T R Raja Mannar, Editor

## Message from Director (Technical)

I would like to convey my best wishes to all of you on my assuming charge as Director (Technical) of this august institution which has grown to be a national asset in strategic electronics. I would like to assure you that it would be my endeavour to take it further and I would spare no effort in this direction.

The last few years have posed challenges but have also been rewarding by enabling the company to continue on a growth path. We have been consistently increasing our turnover and are poised to reach a new peak this year. Our emphasis on technology development continues resulting in new products like MPROGICON PLC, Indigenous Secure Router, Secure Network Access System, EVM Mark II, VVPAT being launched recently. We expect to sustain this momentum in technology development which would help us to increase our turnover as well as profitability in the years to come.

We are making investments in human resources so that we stay abreast of the technology curve. We are also laying increased emphasis on knowledge enhancement and competency building through regular training at all levels. Talent attraction and retention is a key challenge in these times and we have taken measures such as mentoring and team-building to foster a sense of belonging and ownership among the young engineers.

We have been upgrading our infrastructure and adding new facilities to be able to address the emerging requirements. The RDICF, HDI PCB and CATF facilities, established with the technological and financial assistance of BARC are already in operation. A fourth facility, EMI/

EMC facility will also be operational shortly. We are also planning large investments in infrastructure during the XII Plan which would create several new facilities and modernise others.

On the business front, while we are addressing large opportunities that are coming up, we also face stiff competition. It is imperative for us to increase our focus on our own technology, price, quality, delivery and customer satisfaction to overcome this challenge. Our contribution levels also need to be improved to take care of the increased fixed expenditure.

I would like to acknowledge, with gratitude, the contributions of our customers, technology partners, suppliers and other associates who have played a crucial role in our achievements. We will continue our association with the Research and Development Laboratories of DAE, DRDO, DST, ISRO as well as the leading Academic Institutions for new products and projects.

Friends, let us rededicate ourselves to taking our company to the new heights in strategic electronics. I seek your active participation in contributing to a vibrant and exciting future.

I wish all of you the very best.

**- P Sudhakar**



**S**hri P Sudhakar, Executive Director (Defence System Group), ECIL took charge as Director (Technical), ECIL on 30<sup>th</sup> June 2012 in the presence of CMC Members.

Shri P Sudhakar is a graduate in Electrical Engineering from National Institute of Technology, Warangal and holds

a Masters in Integrated Electronics and Circuits from Indian Institute of Technology, Delhi. He is trained abroad in Advanced Management Programme. Shri P Sudhakar started his professional career with ECIL as a Technical Officer in 1979 and held many important positions before taking over as Director (Technical). During the past 33 years of distinguished service with ECIL, he had been in charge of various activities such as R&D, Project Management, Manufacturing etc. He has been closely involved with major Nuclear and Defence programs and had successfully led the execution of a number of projects of strategic importance for the nation undertaken by ECIL. ECIL News Letter wishes Shri Sudhakar 'all the best' in his efforts in making ECIL a technology leader as envisaged by C&MD in his Vision 2020 document.

# Programmable Logic Controllers

G Narayan Gopalakrishnan \*



## Introduction

A truly indigenous design with form and features comparable to international PLC brands, ECIL's PLC is IEC 61131-2/3 compliant and amenable to independent verification & validation.

Programmable Logic Controllers commonly known as PLCs are used basically to automate the Process Control in Chemical Plants, Steel Plants, Nuclear Plants, Transportation and Building Automation etc. PLCs have three basic functions of control, input and output. The PLC has a control program resident in the memory and the programs are executed as part of repetitive process referred to as PLC Scan Cycle. PLC Scan Cycle begins with the PLC reading the status of its input.

The application program is executed and based on this information the values of output are generated. The PLC then performs internal diagnostics and communication tasks. The scan cycle gets completed by setting the outputs and the cycle starts all over again. The cycle time of a PLC scan depends on the size of PLC program, the no. of I/Os and the amount of data exchanged during communication phase. PLC mainly performs function such as logic sequencing, timing, counting and arithmetic control and process control.

*Designed and developed indigenously, these PLC systems will set new price/performance benchmarks in Industrial Automation. MPROGICON 5000 Series of Programmable Logic Controllers are targeted to serve critical applications where safety & security are a concern*

PLC Hardware generally consists of Processor Card known as CPU module, Digital Input & Output modules and Analog Input & Output modules. Several optional modules are provided to process special process inputs like Thermocouples, RTDs, Strain Gauges, Pulse Inputs, Position Sensing of Stepper Motor shafts etc. Similarly to drive outputs for special applications like Solenoid drive, Pulse-Width modulation, TRIAC control for A/C power control, special modules are used. PLCs are used for both open loop and closed loop control applications.

## ECIL's Contribution

ECIL has been in the forefront of indigenous development of PLC systems for Industrial Automation and has been supplying the PLC systems for nuclear power plants, steel plants and oil & gas pipelines. Based on its four decades of experience in building high reliability automation systems, ECIL has come out with the state-of-the-art PLC system under the brand name "MPROGICON 5000 Series Programmable

Logic Controllers" and the same was launched on 18<sup>th</sup> May 2012 by Dr Anil Kakodkar, Member AEC & Dr Homi Babha Chair Professor.

## MPROGICON 5000 PLC System Features

MPROGICON 5000 Series Programmable Logic Controllers offer next generation PLC systems for process control automation. Designed and developed indigenously, these PLC systems will set new price/performance benchmarks in Industrial Automation. MPROGICON 5000 Series of PLCs are targeted to serve critical applications where safety & security are a concern. Coupled with ECIL's philosophy of certainty of supply and support, protection against obsolescence and nation-wide service network, MPROGICON 5000 Series PLC system provide scalable solution to varied needs of the customers.

## Technology

The MPROGICON 5000 Series PLC Systems hardware construction enables System Integrators to build the PLC system to meet varied system requirements. All the hardware modules are manufactured with low power industrial grade components and are qualified for operating in severe environmental conditions. The MPROGICON 5000 Series PLC Systems are designed to comply with the IEC 61131-2, Third Edition, 2007-07, a standard for

PLCs which include the specifications for EMI/EMC, shock & vibration, storage, operating temperature and humidity etc. The MPROGICON 5000 Series PLC uses industry standard & familiar programming interface (IEC 61131-3), integrated development environment (IDE) and field engineering standards. These features substantially reduce integration issues with third-party hardware and serves to minimize system design time and project risks.

## Scalability

The MPROGICON 5000 Power Series PLC system has compact and modular construction that adapts to the varied needs of Industrial Automation. The MPROGICON 5000 Series PLC systems portfolio encompasses Stand-alone & Redundant/fault-tolerant PLCs, SCADA MMI and distributed control systems spanning wide ranges in I/O capacity / size and geographical extent. For PLC requirements that demand high I/O count or I/O devices distributed over a geographical area, MPROGICON 5000 Series PLC system also support remote I/O configuration. All the MPROGICON 5000 Series

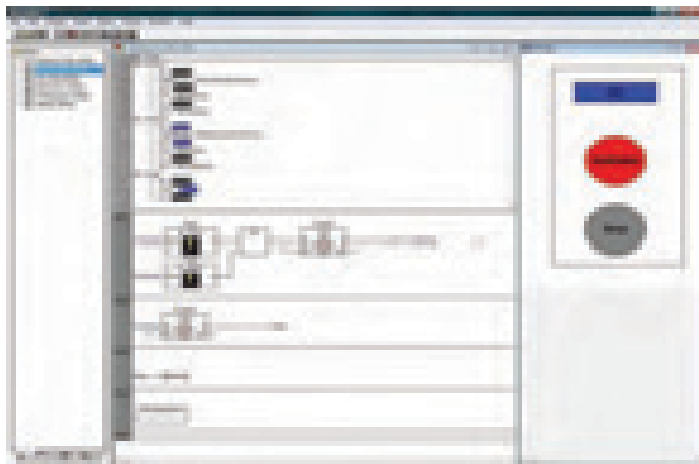
\* Shri G Narayan Gopalakrishnan, AGM, ECIL has been leading the design & development of Programmable Logic Controllers for industrial automation, application support and business development for the last 30 years. His other areas of interest include Embedded Systems Development.



PLC systems have extensive online diagnostic features which facilitate easy maintenance and troubleshooting.

## Graphical User Interface for PLC Programming

To fulfill the need to have a programming system for control and operation of the MPROGICON 5000 Power Series PLC system, ECIL is providing a GUI based Programming Software (PS) based on MS-Windows/Linux operating system running on an off-the-shelf PC. The Programming environment is fully compliant to IEC 61131-3 and supports all the five languages defined by the standard namely Ladder Diagram (LD), Function Blocks Diagram (FBD), Instruction List (IL), Structured Text (ST) and Sequential Function Chart (SFC).



Programming Software

In addition the PS supports all the standard libraries mandated by the IEC 61131-3. The PS enables the MPROGICON 5000 Power Series PLC system user to configure, design, develop, compile, load, debug and document the control application logic and view PLC diagnostics. The PS also provides means to monitor control application logic variables, force the variables to any given state and maintain the MPROGICON 5000 Power Series PLC system. The PS also provides Simulation facility to test the user application program without PLC hardware.

## Human-Machine Interface

The MPROGICON 5000 Series PLC systems provide Modbus Server Interface via Modbus/TCP, Modbus Serial protocol and OPC Server so that third party HMI packages can be seamlessly interfaced to the MPROGICON 5000 Series PLC system.

## SCADA Package

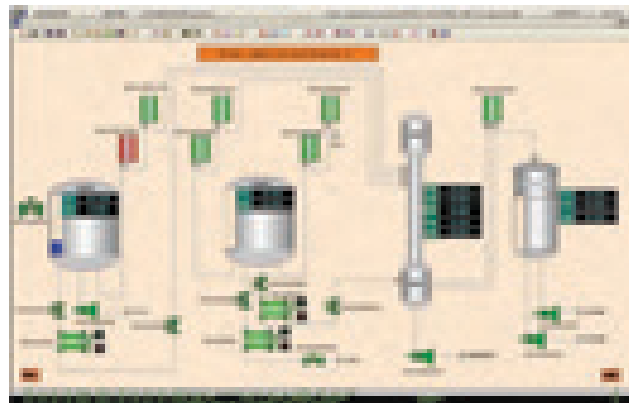
Recognizing the current trends in Industrial Automation, ECIL offers an indigenously developed SCADA package named ECSCADA. Easy to install and configure, ECSCADA is ideal for a HMI that needs integrated logging and data processing functions, trending and reporting functions.

By seamlessly supporting the MPROGICON 5000 Power Series PLC system of ECIL, the ECSCADA provides an open

window to the operation of the control system based on ECIL's MPROGICON 5000 Power Series PLC system.

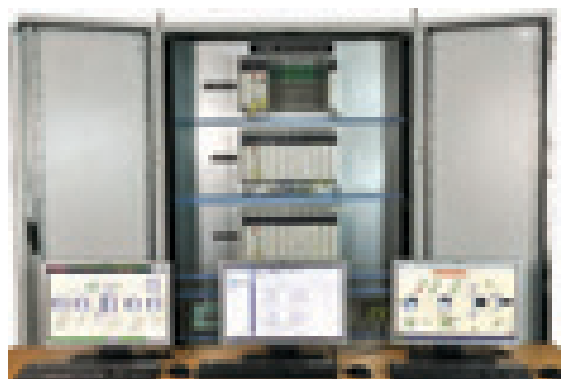
## MPROGICON 5000 Series PLC Models

**MPROGICON 5100 :** MPROGICON 5100 is an IEC 61131 compliant Modular Power Series PLC System with Local I/O sub-system and Integrated CPU sub-system.



ECSCADA – HMI

**MPROGICON 5200 :** MPROGICON 5200 is a Fault Tolerant, Modular Dual CPU Redundant IEC 61131 compliant Power Series PLC System with Remote I/O sub-system.



MPROGICON 5200

## Key Features of PLC

ECIL's in-depth experience in indigenous development and integrating the systems around third-party products has been brought to bear in designing a state-of-the-art MPROGICON 5000 Series that can be summarized below

- Truly Indigenous Design
- Scalable and Economical to meet varied process automation needs
- Modular and Rugged construction
- Low power consumption and Lower Temperature rise over ambient
- Nationwide network to provide complete life-cycle support
- Obsolescence management to protect customer investments
- Independent Verification & Validation of the Design process

# Carrier Ethernet Switch Router

## Solution for Next Generation Transport Network

Braja B Nayak \*



### Introduction

ECIL's Carrier Ethernet Switch Router (EC CESR) is an indigenous building block integrating Carrier Ethernet, OTN and Routing technologies in a single fabric best suited for next generation transport networks.

The phenomenal changes in the present transport network are fuelled by the increased bandwidth demand due to mobile computing, residential triple play, Video-on-Demand and cloud based services. According to latest forecast Internet traffic growth will continue to rise over the next five years, hitting a whopping 767 exabytes by 2014. This exponential rise in Internet Protocol (IP) traffic can lead to congestion in the networks, which compels the service providers to enhance their infrastructure and continuously scout for more efficient innovative technologies. The existing transport network is built on legacy technologies that include Frame Relay (FR), Asynchronous Transfer Mode (ATM) etc. at layer 2 and TDM & SONET at layer 1. These legacy systems have constraint of bandwidth scalability due to their inherent technological restrictions. To overcome this impediment and meet the growing demands of emerging services, Carrier Ethernet has evolved.

*Built with a path-breaking technology EC CES router collapses the lower three layers of the Internet protocol stack into a single layer. This innovative and completely indigenous technology is poised for replacing not so efficient present version of the Internet hierarchy with IP as the dominant network protocol, Ethernet as the MAC protocol and WDM at the physical layer*

### Carrier Ethernet Technology

Metro Ethernet Forum (MEF) which is the international body promoting Ethernet, defines Carrier Ethernet as ubiquitous, standardized, carrier-class service and network bundled with five specialized attributes that distinguish Carrier Ethernet from familiar LAN based Ethernet. These five attributes are Standardized services, Scalability, Reliability, Quality-of-Service (QoS) and Service management which open up the door for an all Ethernet network. It is expected that over the 5 years from 2012 to 2016, operators will spend a cumulative \$186 billion worldwide on Carrier Ethernet Equipment, outpacing overall telecom capex. All major operators over the globe have explicit IP NGN transformation projects going, for which they will use plenty of Ethernet as they gradually replace their legacy SONET/SDH equipment.

### EC CES Router

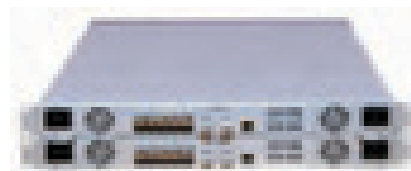
In order to meet the growing demand of the nation, ECIL is manufacturing its flagship product EC Carrier Ethernet Switch Router (EC CES Router) under licence agreement from IIT-Bombay. Built with a path-breaking technology EC CES router collapses the lower three layers of the Internet protocol stack into a single layer. This innovative and completely indigenous technology is poised for replacing not so efficient present version of the Internet hierarchy with IP as the dominant network protocol,

Ethernet as the MAC protocol and WDM at the physical layer. In addition EC CES Router supports DWDM fabric at layer 1 – hence facilitates excellent fiber utilization and minimizes energy consumption.

### Benefits of EC CES Router

- Low Power Consumption (Green Technology) : nominal 50 W
- Low Latency (port to port) : 1 microsecond
- Small Footprint : 1U
- Cost-effective, Indigenous Technology & Inherent Topological Security.

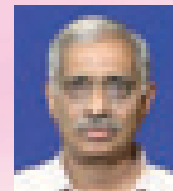
EC CES router product portfolio includes three models which are introduced as a solution to the next generation transport networks. The product takes into cognizance, network hierarchy and interconnection methodology in Metropolitan/Enterprise networks and technological advances in emerging Carrier Ethernet (PBB-TE/MPLS-TP) leveraging deployment of Ethernet from access to core. The 3 models of EC CES Router with varying interfaces and capabilities support E-Line, E-LAN, OTN services thus making them suitable for deployment in wide range of network from a Data-Centre to Metro/Core transport network, Metro Aggregation and access network.



ECR • 1000 Series Router

The other highlighting technical feature of EC CES Router is its innate capability of unique addressing and routing mechanism which facilitates inherent topological security thus positioning this product as the core component of any secure transport network. Integration of Carrier Ethernet with advanced Optical Transport Network (OTN) enhances the capability of EC CES router to multi-domain service provisioning, network-flow tracking and long haul reach up to 1000 KM without regeneration of signal. Apart from the price & performance benefits to transport network, EC CES routers are also suited to strategic and defence networks of the country due to their indigenous tag. The routers find applications in Data-Center/Cloud Computing services, Wide Area/Metropolitan/Enterprise Network Carrier Ethernet core transport network Broad band services. EC CES Router series are truly revolutionary and poised to set new price/performance benchmarks in the telecommunication industry in the country.

\* Shri Braja B Nayak, Sr DGM, ECIL leads the Business Development team for EC CES Routers. His areas of interest include Next Generation Networks, Fiber Optic Communication and Protocol Validation.



**S**ecure Network Access System (SNAS) is an integrated security framework, which can secure any network intelligently by sensing and automatically responding to security threats. SNAS identifies 'who', 'what' and 'where' details of the end systems connected in a network. SNAS can see everything on the local network, i.e. all devices, Operating systems and all Users.

With multitudes of devices such as Laptops, Cell phones and PDAs having ability to connect to internet, becoming also part of an Enterprise LAN, it is required to secure the internal network against threats and security policy violations and ensure an organization's network activity is in compliance with stated policies.

The SNAS framework has got the following main components

## 1. SNAS – Network Admission Control (NAC)

SNAS offers a comprehensive solution of proactive network security by determining whether an end system is compliant with an organization's network security policies. Once an end system has gained access to the network securely, continuous threat analysis and policy enforcement are provided through intelligent integration with other SNAS components.

## 2. SNAS – Network Behavioural Anomaly Detection (NBAD)

SNAS- Intrusion Detection System (IDS), Intrusion Protection System (IPS) and Network Behavioural Anomaly Detection (NBAD) technology monitors the behaviour of end systems continuously. Any malicious behaviour of end systems in terms of network traffic, network applications, propagation of malicious activities and Denial of Service (DOS) attack will be detected and such systems will be isolated from the network in near real time. The integrated SNAS-NAC and SNAS-NBAD approach provides a dynamic intrusion response and proactive prevention against zero-day attacks.

## 3. SNAS – Network Management Suite (NMS)

SNAS –NMS, an application visualization module provides a framework for aligning event detection with source location and threat mitigation. It provides comprehensive graphical

visualization of all network devices, end systems and their status and security states.

## 4. Rouge Systems Detection & Isolation

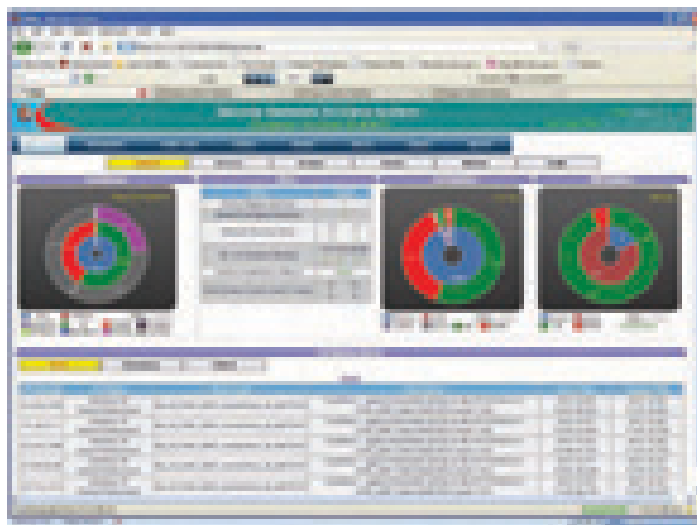
SNAS can detect rouge devices (end systems, network devices, wireless devices etc) in real time. Even when a rouge system does not have an IP address, SNAS can detect. It can also detect any mobile devices connected through unauthorized wireless access point or by ad-hoc mode of wireless device.

## 5. SNAS – End System Application Awareness Firewall

The end system's authorization controls are managed using two approaches. One is using dynamic manipulation of access control rules on network devices and other using dynamic ACL on firewall which isolate user segments and service segments in a network. The firewall rules are dynamic and the ACL rules written only if the end system is compliant with an organization's network

security requirements. The rules will be removed whenever the end system is OFF, so that spoofing of end systems through firewall is not allowed.

*SNAS identifies 'who', 'what' and 'where' details of the end systems connected in a network. SNAS can see everything on the local network, i.e. all devices, Operating systems and all Users.*



SNAS-NMS Suite

In a nutshell SNAS appliance comprehensively covers all functionalities needed to secure Intranet network traffic in totality. Developed indigenously by Computer Division, BARC, the product is being marketed and technically supported by ECIL.

\* Shri K V Suresh, Sr DGM, ECIL was actively involved in Integrated Security Systems(ISS), Common Wealth Games 2010 Network project. His areas of interest include Design and Development of Datacenter, Study of Data Security Threats & Prevention of Attacks.



# 21m MACE Telescope

Ch V R S Gopalakrishna\*

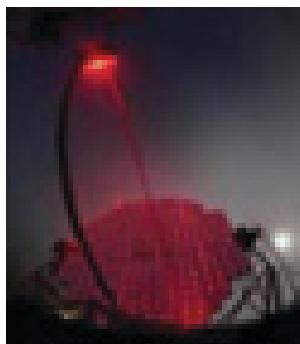
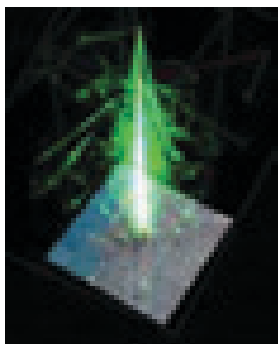


## Introduction

Very High Energy (VHE) gamma - rays offer a unique insight into some of the most extreme regions of our universe. These exceptionally energetic photons need huge Telescopes that can collect the gamma-rays.

MACE (Major Atmospheric Cherenkov Experiment) will enable study of cosmic gamma rays between 20 and 100 GeV and upto 5 TeV. It is the world's largest telescope at the highest altitude. It will be remotely operated and will run on solar power.

When a VHE gamma-ray enters the Earth's atmosphere, it generates a shower of secondary charged particles which in turn cause a flash of blue Cherenkov light, which lasts for just ten thousand millionths of a second. To detect the flashes of Cherenkov light, photomultiplier tube cameras are used at the focus of large Telescope.



Major Atmospheric Cherenkov Experiment

A 21m dia MACE Telescope is being setup at Hanle (32.80 N, 78.90 E, 4200 m above MSL), Ladakh region of North India by taking advantage of high altitude in increasing light collecting area by a factor 2.5, under the aegis of Bhabha Atomic Research Centre (BARC) in association with Indian Institute of Astrophysics (IIA) and Tata Institute of Fundamental Research (TIFR). ECIL has been entrusted with the responsibility of setting up the facility at Hanle that includes Design, Manufacture and Installation & Commissioning.

## 21m MACE Telescope Components

It is comprised of a large area tessellated light collector (356sqm), made up of 356 mirror panels. A high resolution

Imaging camera (weighing about 1500 Kgs) for detection and quantification of the atmospheric Cherenkov events forms the focal plane instrumentation of the telescope. The elevation over azimuth mounted telescope basket structure has two axes movement capability  $\pm 270^\circ$  in azimuth and  $-26^\circ$  to  $+165^\circ$  in elevation for pointing towards and tracking any direction in the sky in the  $0^\circ$  to  $70^\circ$  Zenithal angle range (Corresponding to Elevation angle of  $90^\circ$  to  $20^\circ$  above horizontal).

**MACE will enable study of cosmic gamma rays between 20 and 100 GeV and upto 5 TeV. It is the world's largest telescope at the highest altitude. It will be remotely operated and will run on solar power**

The novel feature of the telescope is the design of the integrated imaging camera, which contains 832 photomultiplier-based pixels and all the signal processing and data acquisition electronics.

## The 21m MACE Telescope will aid understanding in

- Astrophysics (SNR, Pulsars, AGN, Diffuse b/g, unidentified EGRET sources, GRB)
- Fundamental Physics (Gamma-ray horizon, dark matter detection, quantum gravity etc.)
- Particle acceleration mechanisms for gamma-ray generation hadronic / leptonic)
- Spectral cut off of Pulsars
- Detailed follow-up of GLAST sources

## Main Features of the MACE Telescope

- 21m dia tessellated light collector (356 mirror panels each comprising 4 diamond turned aluminum spherical mirror facets)
- Variable focal length Mirrors (25 to 26m) divided into 12 concentric zones with each zone mirrors of fixed focal length
- The spot size for the light collector, having an area of 356 sq. meters is of the order of 50 mm diameter ( $\sim 7$  arc-mins.) for "on-axis" incidence
- Wheel and Track mount with coverage of  $\pm 270^\circ$  in azimuth and  $-26^\circ$  to  $165^\circ$  in Elevation
- The structure is designed to operate in winds of speed up to 30 kmph and retain its structural form in the parking position in winds of speed up to 150 kmph
- A 4-boom structure will hold the camera at the focal plane at a distance of 25 meters from vertex

\* Shri Ch V R S Gopalakrishna, ED (ASG), ECIL is actively involved in indigenous development of Microwave Communication Antenna Systems, Design of Earth Station Antennas, TVRO Antennas for INSAT programme, shaped beam antennas for tracking UAVs, the 32m DSN Antenna for Chandrayaan-1 programme. Presently working on establishing 21m MACE telescope at very high altitudes. His areas of interest include Computational Electro-magnetics and state-of the-art Antenna Measurements.



- PMT based imaging Camera
- Active Mirror Control mechanism to ensure a spot size of 30 mm

### The Telescope Control Unit Features

- Closed loop position control system, with 17 bit Optical encoders and DC Servo motors in a counter torque configuration
- Supports Slew for quick repositioning of the telescope to a desired direction (within  $\pm 5^\circ$  of the target direction), Position and Track modes of operation
- An integrated data acquisition and control system based on a 16-channel detector module
- The removable 16-channel detector module of 16 photomultiplier tubes complete comprising with their programmable high voltage generators, amplifier and discriminator circuits



*MACE Site at Hanle, Ladakh*

- Continuous digitization circuits which can be enabled by the trigger generation electronics located at the back of the camera
- Analog Ring Sampler circuits for digitization of the analog PMT outputs at sampling rate of 1GHz or more
- Digitized data storage on memory boards located inside the camera
- Concurrent downloading to the PC located in the control room via high speed optical links
- Solar Photo Voltaic (SPV) based power supply with a battery bank to support 2 Sunless days

### Design Challenges

- Iso-static configurations in parking position to allow for free thermal expansion during daytime and a hyper-static configuration during operation to allow for the optimum stiffness
- Minimisation of dimensional variations due to residual stresses caused during fabrication and assembly



*Proof Assembly Progress at APSD, ECIL*

- Local protection of critical components
- Modular design with maximisation of standardised components to overcome transportation problems (limiting the size of sub assembly modules to 4mx2mx2m)
- Provision for cleaning the mirror surface
- Proper selection of the surface coating of the structure to reduce absorption of solar radiation during daytime and radiation cooling during night
- Provision for access to all mirror facets by a suitable array of access ramps and ladders when the camera is in the parking position for maintenance
- Passive Solar Construction of Control Station Building, Guest House and SPV Buildings

The state-of-the-art telescope is being manufactured and proof assembled at ASG & CAD, ECIL, Hyderabad.

The Fabrication of structural elements is complete and the proof assembly of the telescope is in progress at AP&SD. When fully integrated with proposed National Infrared Telescope, it would be a unique facility in the world.

The telescope is all set to capture the images of gamma-ray bursts by end November 2012.

## ECIL at DEFEXPO 2012

**D**EFEXPO India 2012, India's biggest-ever land, naval and homeland security systems exhibition, was held at Pragati Maidan, New Delhi from 29<sup>th</sup> March 2012 to 1<sup>st</sup> April 2012. This impressive event hosted 567 exhibitors. All major public sector companies had a presence, along with hundreds of large and small private sector companies – 335 Indian exhibitors in total. Over 200 foreign companies from 32 countries had participated in the exhibition.



*MoU with SAMEL 90 PLC*



This Exhibition is very special for companies like ECIL whose major business comes from Defence. India is today the world's largest importer of defence systems. The annual Indian defence budget is over \$40 billion and growing annually at more than 15 percent and hence there are a lot of opportunities to further increase business.

ECIL displayed a wide range of products and put up a spectacular show at DEFEXPO 2012. ECIL Systems and Products invoked lot of interest. The major defence products and systems that were displayed include Electronic Warfare and Surveillance Systems, Custom Built COMINT systems on various platforms, VHF data links and Combat net radio, V/UHF radio communication Equipment, Command & Control Systems for Missiles, Checkout systems for Missiles, Mission Computer Systems, Stabilized Antenna Platforms for LCA Multi-Mode Radar and SATCOM terminals on UAV and Active Radar Seekers, Electro-Mechanical Actuators for UAV and missiles, 2/4 axis Gimbal payload assembly for UAVs, Various types of fuzes and jammers, Ka Band Suitcase Antenna, Ku Band Air Borne VSAT terminal, Antenna Platform Unit, IP Encryptors, Next Generation Bulk Encryption Units etc and Demo model of ECIL's Integrated Security Systems.

Visitors included high ranking Officials from Ministry of Defence, Armed Forces, Paramilitary and other civil organizations. They were impressed with ECIL's technological prowess. Many foreign and Indian firms showed keen interest to enter into collaboration with ECIL. ECIL entered into an MoU with M/s Rockwell Collins, a world-renowned military communication equipment manufacturer having global presence. ECIL also signed an MoU with SAMEL 90 PLC, a leading manufacturer of Defence Electronics Systems from Bulgaria, for various types of Jammers. The response from DEFEXPO 2012 reiterated the fact that ECIL is geared up to meet the technological requirements of India's Defence needs on Land, Sea and Air today and in future.

### FAREWELL



**Shri N S S Prasada Rao** Director (Technical) retired from service on attaining superannuation on 30<sup>th</sup> June 2012. He had an illustrious career of over 37 years at ECIL during which he led CNSG to new heights with a sales turnover of Rs 306 crores for FY 2011-12. As Director (Technical) he was instrumental in re-establishing ECIL as a Center of Excellence in strategic electronics. ECIL News Letter wishes Shri NSS Prasada Rao a happy and healthy retired life.

## National Technology Day Celebrations at ECIL

A function to celebrate National Technology Day was organized by Corporate Research & Development in the Mini-Auditorium, Administrative Building, ECIL on 11<sup>th</sup> May 2012, highlighting the progress of various Research & Development activities and New Products developed in ECIL during the year 2011-12. The Chief Guest for the occasion was Shri N Saibaba, Distinguished Scientist & Chief Executive, Nuclear Fuel Complex, Hyderabad.

Shri N S S Prasada Rao, Director (Technical), ECIL in his welcome address gave insight into the significance of National Technology Day. He remarked that May 11<sup>th</sup> is annually

Later the Chief Guest, Shri N Saibaba, DS & CE, NFC, Hyderabad gave a talk on “Nuclear Energy – The Most Attractive Option”. The talk included an analytical presentation on the importance of Nuclear Power and its advantages over Thermal and Hydel power, aspects of nuclear safety in India, a forecast for expected energy requirements etc. He explained that nuclear fuel does not emit greenhouse gases and is virtually pollution free. To meet the future energy requirements of India, Nuclear Energy is an inevitable option.

He talked about new nuclear energy technologies like Advanced Heavy Water Reactor (AHWR), Accelerator Driven



*Releasing of ECIL R&D Report by Shri N Saibaba, DS & CE, NFC, Hyderabad on National Technology Day*

observed as National Technology Day all over India to commemorate various technological breakthroughs in the country. He also highlighted some of the R&D achievements of ECIL. Shri Y S Mayya, C&MD, ECIL spoke about ECIL's policy of a rational mix of indigenous development and licensed manufacturing. He asserted that self-reliance remains the guiding principle through development of in-house products with Indian Intellectual Property (IP). ECIL should leverage its linkages with National Laboratories and Academic institution, he stated.

Sub-critical Systems (ADSS), High Temperature Reactors (HTR), Hydrogen/Liquid Fuel production using Nuclear Energy, Solid Oxide Fuel Cells (SOFC), Fusion Energy and Accelerators. He stressed that for a large developing country like India, nuclear power is a must for sustainable supply of energy. He also emphasized the need for more cooperation between ECIL and NFC for futuristic technological development especially in nuclear sector.

On this occasion, ECIL R&D Report for 2011-12 was released by the Chief Guest, Shri N Saibaba. The report describes new products, including components & complex systems, introduced by the company in the year 2011-12 covering Nuclear, Defence, Aerospace, Security and Telecom domains. A marked enhancement in the quality and quantity of the R&D deliverables is visible as the company regains critical mass in its efforts to re-establish itself as a Centre of Excellence in strategic electronics. The report also describes the New R&D Policy and Vision at ECIL. Shri T R Raja Mannar, GM, CR&D & SSSD proposed vote of thanks.



*Invited talk by Chief Guest Shri N Saibaba*

## Our Esteemed Visitors



*Vice Admiral V Kannan, Director( PD) ATVP, Chairman, PRC and Shri G P Srivastava, Director (E&IG), BARC showing keen interest in ECIL's products*



*Maj Gen H S Johar, ADG Tac ' C ', Chairman, Feasibility Study Group being briefed on Software Defined Radios product by Director (P) & ED (CNSG), ECIL*



*Shri H S Brahma, Election Commissioner, ECI, New Delhi visited EMSD, ECIL to assess the performance of VVPAT & also to study the features of EVM Mark-II. He appreciated the good work done by ECIL*



*Dr R K Malhotra, Director (R&D), IOCL and Dr B Basu Executive Director, IOCL visited ECIL to explore new business opportunities for Pipeline Inspection Gauge*



*A Delegation from Election Commission of Indonesia had detailed talks on new businesses opportunities with our Senior Executives*



*Dr R Chidambaram, Principal Scientific Advisor to Govt of India being briefed on Encryption Products by Shri P Sudhakar, Director (Technical), ECIL*



### Flash News

Shri Y S Mayya, our C&MD joined back his parent organization, BARC on 3<sup>rd</sup> September 2012 as OSD, E&I Group, after serving ECIL with distinction for 5 years, first as Director (Technical) and then as Chairman and Managing Director. His initiatives in New Business Strategies, R&D, Technology Management and HRD transformed ECIL into a state-of-the-art Strategic

Electronics Company. His endearing nature, superior leadership qualities, technical expertise and business acumen will be remembered by one and all at ECIL. ECIL News Letter wishes a great success in all his future endeavours.

Maj Gen (Retd) Sanjeev Loomba, Director (P) tookover as Acting C&MD. ECIL News Letter congratulates Maj Gen Sanjeev Loomba and wishes him all the success.





## Major Events

**E**CIL launched two high technology products “Carrier Ethernet Switch Router” and “Secure Network Access System (SNAS)” on the occasion of its Foundation Day, April 11, 2012 at an impressive ceremony in New Delhi. The ECR 1000 series router manufactured under license from IIT Bombay was launched by Dr R Chidambaram, Principal Scientific Advisor to the Govt. of India. The function was attended by many luminaries including Dr Srikumar Banerjee, Chairman AEC & Secretary DAE.

The ECR-1000 Series Switch Router is based on path breaking technology conceptualized in the Gigabit networking laboratory at IIT Bombay. SNAS was designed and developed by BARC.



**D**r Anil Kakodkar, Member Atomic Energy Commission unveiled ECIL made MPROGICON Programmable Logic Controller on 18<sup>th</sup> May 2012 at a glittering function at Nalanda Complex attended by a large number of users and experts. The new high performance, industrial strength Programmable Logic Controllers developed by ECIL promises to mitigate the security concerns arising out of potential malware in these vital equipment which often form the nervous system of industrial plants.

Shri Y S Mayya, C&MD, ECIL stated that ECIL will be targeting these PLCs for use in Strategic sectors of Atomic Energy, Defence, Aerospace and Homeland security where safety and security cannot be compromised. These 3rd generation

PLCs consume less power, run cool, meet international standards and are equally well suited for automation applications in thermal power plants, process industry, transport and manufacturing industry. The product encapsulates company's decades of experience in deployment of PLC for automation in nuclear energy, oil & gas and manufacturing sectors. The launch of this product also gains significance in light of the new policy by Govt. of India giving preference to Indian electronic equipment where security sensitivities exist.



**T**he valedictory function of GET-2012 Batch was conducted on 18<sup>th</sup> May 2012. Dr Anil Kakodkar, DAE Homi Bhabha Chair Professor and Member, Atomic Energy Commission was the Chief Guest for this function. On this occasion, Dr Anil Kakodkar, Shri Y S Mayya, C&MD and Maj Gen Sanjeev Loomba, Director (Personnel) addressed the participants. Dr Kakodkar also gave away prizes to the meritorious GETs from each discipline. A number of dignitaries from NFC, DRDO, BARC, NPCIL attended the function. A number of in-house programmes were conducted as a part of ECIL's HRD Programme which include Quality Management, Reading of Engineering Drawings, Digital Electronics, Project Management, Certified Reliability Engineer, Thermal Analysis, Coding Theory in association with Indian Institute of Science, Bangalore, My SQL DBA, ISO 9000:2008, Internal Auditors Training Programme, Surface Mount Technology, EMI / EMC and Cryptography and Network Security in association with SETS-Chennai.

## Congratulations

**Shri Sekhar Basu**, renowned Scientist and Chief Executive, Nuclear Recycle Board (NRB) of the Bhabha Atomic Research Centre (BARC), took over as Director of BARC from Dr R K Sinha on June 19, 2012 at a simple ceremony held at BARC, Mumbai.

Shri S Basu is one of the architects of India's 80 MWt compact Pressurised Water Reactor (PWR), which will power Arihant, the country's nuclear-powered submarine. He graduated in Mechanical Engineering from VJTI, University of Mumbai in 1974. On completion of the one-year BARC Training School programme, he joined the Reactor Engineering Division, BARC in the year 1975.



Shri S Basu has been conferred several awards and these include: Indian Nuclear Society Award 2002, DAE Group Achievement Award 2006 and the DAE Special Achievement Award 2007. He is also a Fellow of the Indian National Academy of Engineers (INAE).

ECIL News Letter conveys 'Hearty Congratulations' and Best Wishes to Shri S Basu

*From the Archives...*



**ECIL in 'Test Cricket Telecasting'-Bangalore, Nov 1974**

## पूर्वांचल कार्यालय (कोलकाता) में हिन्दी कार्यशाला

राजभाषा हिन्दी के प्रभावात्मक कार्यान्वयन हेतु दिनांक 12-7-2012 (बृहस्पतिवार) के दिन प्रातः 11-00 बजे हिन्दी कार्यशाला का आयोजन किया गया। सभा का उद्घाटन सचिव, राजभाषा कार्यान्वयन उपसमिति ने किया। आयोजन में मंच पर उपस्थित सभी अधिकारियों ने हिन्दी की प्रगति व प्रसार के लिए अपना अमूल्य सुझाव दिया। श्री संजय कुमार चौधरी (हिन्दी अनुवादक), राजभाषा कार्यान्वयन उपसमिति ने सभा का संचालन किया।

कार्यशाला में निबंध एवं पारिभाषिक शब्दावली, लेखन और आशु भाषण प्रतियोगिता का आयोजन किया गया जिसमें एस एस मुखर्जी (सदस्य), सोमनाथ डे (सदस्य), संजय कुमार चौधरी (हिन्दी अनुवादक) ने प्रतियोगिता के सटीक निर्णय के लिए विचारक का दायित्व संभाला।

इस प्रतियोगिता में प्रथम, द्वितीय एवं तृतीय स्थानाधिकारियों के नाम निम्नलिखित हैं:

निबंध एवं पारिभाषिक शब्दावली लेखन

1. एस दे सरकार, प्रथम पुरस्कार, 2. लीना घोष, द्वितीय पुरस्कार
3. मधुसूदन राय, तृतीय पुरस्कार,



आशु भाषण

1. दीपक सरकार, प्रथम पुरस्कार, 2. एस दे सरकार, द्वितीय पुरस्कार,
3. तपन बेनर्जी, तृतीय पुरस्कार

श्री डी देवनाथ, वरिष्ठ उप महाप्रबन्धक एवं राजभाषा कार्यान्वयन उपसमिति के सभी सदस्यों ने अपना अमूल्य समय देकर इसमें सक्रिय भूमिका निभाई। सभी को धन्यवाद देते हुए संजय कुमार चौधरी (हिन्दी अनुवादक) ने सभा की समाप्ति की घोषणा की।



7 जून 2012 को राजभाषा पर आंचलिक कार्यालय, नई दिल्ली के संसदीय राजभाषा समिति द्वारा निरीक्षण

## हिन्दी कार्यशाला - मुंबई

मुंबई स्थित आंचलिक कार्यालय में शनिवार, दिनांक 23-6-2012 को 11:00 बजे 'हिन्दी कार्यशाला' का आयोजन किया गया। इस कार्यशाला में महानगर टेलीफोन निगम लिमिटेड, मुंबई से सहायक निदेशक (राजभाषा), श्री कलीम उल्लाह खान को अतिथि व्याख्याता के रूप में 'हिन्दी में पत्राचार, टिप्पणी कैसे लिखे और इसमें पारिभाषिक शब्दावली का उपयोग कैसे करें' विषय पर व्याख्यान देने के लिए आमंत्रित किया गया।

स्वागत के पश्चात् श्री खान ने सभी उपस्थित कर्मचारियों को सरल राजभाषा में हिन्दी में पत्राचार, टिप्पणी लिखते समय किस प्रकार की कठिनाई आती है, इसमें पारिभाषिक शब्दावली का उपयोग कैसा किया जाना चाहिए इस बारे में विस्तृत जानकारी प्रदान की। पत्राचार में इस्तेमाल की जानेवाली भाषा, व्याकरण, पारिभाषिक शब्दावली तथा

कम्प्यूटर पर हिन्दी में किस तरह से टंकण किया जाना चाहिए आदि विषयों पर व्याख्यान दिया गया तथा कम्प्यूटर के माध्यम से दिखाया गया।

आंचलिक प्रबन्धक (पश्चिम) ने अपने सम्बोधन में सभी के प्रति आभार प्रकट करते हुए उपस्थित कर्मचारियों को श्री खान द्वारा बताए गए सभी पहलुओं पर अपने रोजमर्रा कार्य में क्रियान्वित करने का अनुरोध किया।

इस कार्यशाला में कुल 41 (22 अधिकारी और 19 कर्मचारी) प्रतिभागी के रूप में उपस्थित थे।

श्री वी.दि. जमदाडे के धन्यवाद ज्ञापन के बाद राजभाषा कार्यशाला सम्पन्न हुई।

## Corporate Social Responsibility

**E**CIL's Corporate Social Responsibility (CSR) Policy is "To promote Corporate Social Responsibility through various community development actions viz., neighborhood welfare, education, health and environment-friendly activities".

Towards meeting this objective, ECIL has focused its attention on improving physical infrastructure in Schools by constructing additional Class Rooms, Computer Labs, Toilet Blocks, Multi-purpose Halls and providing Dual Desks etc. It is also providing Computer Education for students of Govt. Schools in its neighbourhood.

On 3<sup>rd</sup> July 2012, our Chairman & Managing Director, Shri Y S Mayya inaugurated and handed over Computer Lab,



*Shri Y S Mayya, C&MD inaugurating Class Rooms at ZPHS, Kapra, Hyderabad*

Toilet Blocks etc constructed by ECIL at Mandal Parishad Upper Primary School, Gandhi Nagar, Kapra in the presence of Shri Bandari Raji Reddy, MLA, Uppal constituency. Shri Katepalli Janardhan Reddy, MLC was a Special Guest and Shri K Rama Rao, Corporator, GHMC (Greater Hyderabad Municipal Corporation) was the Guest of Honour.

Later he inaugurated two Class Rooms at Zilla Parishad High School, Kapra and Computer Lab and Toilet Block for Girls at Mandal Parishad Upper Primary School at Kamalanagar.



*Shri B Raji Reddy, MLA addressing the gathering*

Shri Y S Mayya stressed that gainful employment for India's vast youth population depends a lot on good school education in a comfortable environment and teachers have a big role in



*Students in the new Computer Lab at MPURS, Harijan wada, Gandhi Nagar*

moulding the future of students and thereby the nation. Maj Gen Sanjeev Loomba, Director (Personnel) and Chairman of ECIL's CSR Committee gave details of ECIL's CSR activities in the last 2 years which focused on improving physical infrastructure in Schools. He said that the responsibility of maintaining the facilities rests with teachers and students.



*New Dual Desks Donated by ECIL at ZPHS, Kapra*

Shri Bandari Raji Reddy, MLA Uppal constituency appreciated the efforts of ECIL Management for constructing classrooms and providing Computer Lab facilities in Govt. Schools located at Kapra and Kamalanagar. He wished that ECIL will do more so that underprivileged students in Govt. Schools get benefitted. Shri Janardhan Reddy, MLC and Shri K Rama Rao, Corporator, GHMC also spoke and thanked ECIL for their CSR initiatives.

During the previous financial year, ECIL provided Computer Education for about 1000 students from 6th Class to 10th Class. The Company organised a Free Medical Camp at Cheekatimaamidi Village, Bommaramaram Mandal, Nalgonda Dist. on 11th March 2012. The unique feature of this camp was the use of a high-tech medical van for consultation by NIMS specialists via satellite. The Medical Camp was a huge success and over 700 people from Cheekatimaamidi village and neighbouring thandas got Blood Tests, ECG, Kidney, Cancer Tests for Women, Eye, Dental and Orthopedic tests done by specialist doctors who were present at the camp.