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समाचार

# ECIL NEWS LETTER

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April 2012



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*“Digit all”*

## National Population Register



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*At the outset, everyone at ECIL deserves kudos for their contribution towards achieving targets set for the financial year just concluded. The new financial year has started on a positive note with an admirable order booking position. This sets the right impetus for achieving targets set in the 'VISION 2020 document'*

*We are happy to announce that 'ECIL News' has been rechristened as 'ECIL News Letter' with an approved Editorial policy and a fresh Editorial Board. This news letter has a greater reach which includes not only the employees but also the important strategic customers. The Editorial board will put in its best efforts towards meeting the expectations of the enhanced reader base.*

*Business challenges are continuously increasing and there is an urgent need to increase bottom line alongside the top line. This is possible only through advanced in-house R&D, collaboration with National R&D Laboratories and tie-ups with international technology leaders. We are happy to share with you that ECIL now has an approved R&D Policy in place. DAE support for ECIL R&D has doubled this year. All these initiatives are part of the continuous efforts to establish a strong R&D base at ECIL and thus aid in the timely introduction of new products for enhanced profitability.*

*It requires no special mention that 'Quality' drives business growth. ECIL has left no stone unturned in reaching such quality levels. We obtained ISO certifications for all our business divisions. Not just that, we also obtained CMMi Level 3 appraisal covering Software development, verification and validation. This has resulted in significantly improved confidence that our customers have in our products developed for mission-critical and safety critical applications.*

*Focus on Human Resources is the key to success in every business. While ECIL is growing with experience, it is heartening to see that the company is turning younger. Induction of young engineers and their training in various technologies and domains are destined to yield rich dividends in the years to come. Creation of necessary infrastructure is also underway towards optimum utilization of human resources and facilities for obtaining increased productivity gains.*

*The lead role taken by ECIL in conducting INSAC 2011 seminar and its passionate participation in DEFEXPO 2012 has strengthened ECIL's brand image among the Nuclear, Defence, Aerospace and Security fraternity. Now it is time for us to rededicate ourselves for furthering the prosperity of ECIL.*

*Any suggestions to improve the News Letter are welcome from one and all.*

*With Best Wishes,*

*Editor*





## Message to ECIL employees from Chairman & Managing Director

**Y**ear 2011-12 has been a definitive year for ECIL with net sales exceeding our target of Rs.1340 Crores and successful closing of many projects. Also a definite progress was made in the colossal exercise of data digitization for NPR Project and launching of nationwide campaign for SECC – two prestigious projects where national aspirations are linked to our performance. The year also witnessed successful completion of large COMINT Projects, C4I systems for Akash & Brahmos, delivery of Radios and C&I Systems for India's first 500 MWe FBTR & P3A reprocessing plants, installation of video surveillance in Delhi city markets. We consolidated our business with significant new orders for Radiation Detectors for ports, Fuzes, Radios, EVMs & COMINT Systems.

Our concerted efforts are expected to result in additional orders in the near future for Security and Surveillance, stabilized platforms and SATCOM terminals. These trends will continue and we must enhance our value addition in these projects. Towards this end, past years saw successful introduction of many new indigenous products by ECIL: Radiation detectors, new EVM, PLC, Routers, Encryption products - to name a few. We successfully organized Annual Conference of Indian Nuclear Society – INSAC 2011 on Strategic Electronics – a 3 days mega event bringing together over 500 participants and galaxy of renowned speakers.

With the inauguration of Compact Antenna Test Facility (CATF), ECIL is now equipped with state of the art infrastructure for characterization and testing of antennas. We signed a host of MoUs and agreements for technology transfer and new collaborations in defence, space, nuclear and telecom sectors.

We articulated our roadmap for the decade covering the 12th plan period as VISION 2020. It is an expression of our aspirations and a statement of our promises and plans. I urge all of you to align your goals to the roadmap set out in the VISION document.

As our company enters in to new financial year 2012-13 with renewed vigour, I wish to acknowledge the hard work and dedication of many which has enabled us to reach

here. The initiatives in HR, modernization, expansion and R&D have started yielding results as we enter 2012-13 with hopes to reach Rs. 2000 Crores turn-over. For more than ten years now, ECIL has been on a steady growth path with respectable profits, growing net worth and regular dividend payouts to Government.

All of this has been achieved without budgetary support, in an extremely competitive business environment with most of our business coming from large, one-of-a-kind projects with long execution periods, high technology content and substantial R&D effort.

We must accelerate the pace of innovation & product development as we enter 12th plan period with enhanced R&D budget and ambitious plans for modernization. Company has ambitious plans set out for the 12th plan period, involving significant investments for new technologies, facilities, R&D programs and modernization. I am sure all of you will seize this opportunity to refashion ECIL as a world-class company in Strategic electronics. The corporate vision to bring about self-reliance in strategic electronics has gained renewed urgency. We must focus towards development of innovative products based on indigenous R&D with world-class quality and aesthetic as differentiators.

The strategic role of Electronics today is not limited to defence, nuclear or aero-space sectors; vital national infrastructures depend on Electronics to function. It is evident that dependency on 'black-box' technologies in our infrastructure exposes us to new vulnerabilities and threats in the form of malware, restrictive IPR regimes, unpredictable licensing policy, high obsolescence rate and proliferation politics. These pose renewed opportunities and myriad challenges for ECIL in this rapidly globalizing world. We must meet these challenges and exploit these opportunities.

As you are aware, Public Sector Enterprises in general and ECIL in particular faces unprecedented challenges today and we have a great responsibility to prove the detractors wrong and meet the challenges head-on. We must recognize our unique strength of being a multi-disciplinary enterprise with enviable heritage of indigenous product base and technology leadership. We must leverage our credentials of endurance, quality, business ethics and fair-play. These innate strengths must be complemented with efficiency and timeliness.

I wish all of you the very best.

Y S Mayya



## 1. Introduction

The Nuclear C&I industry is gearing up to meet the challenges of an imminent growth in Nuclear power world-wide. After decades of placidity there is renewed vigour and race to catch-up with current technology. The key drivers remain the same as before - improved plant availability and safety while minimizing cost. The time tested design principles applicable to safety systems in NPPs still hold sway - simplicity, diversity, independence, defence-in-depth and fail-safety. It is interesting to see as to how these principles will be applied to the emerging technologies. There are new concerns impacting the choice of technologies – while safety was an overarching concern dictating architectures and technologies deployed in Nuclear reactor C&I, information security is likely to emerge as an equally urgent concern. For some time now, V&V processes, methods and techniques were aimed at discovering unintentional and random faults and errors; today the real threat of maliciously introduced malware in semiconductors and software opens up new vistas to V&V professionals to work on. Embedded systems were once thought to be largely immune to this threat - recent stories of malware discovered in Industrial PLCs shows that embedded systems too are vulnerable.

Therefore, Nuclear C&I community should be sceptical and defensive while evaluating new technologies. There will be compelling arguments in favour of adapting a specific technology as they proliferate in the consumer and process industry. The trend set in the previous decades by the consumer industry as the torch bearer of new technology will continue to a large extent atleast as far as semiconductors and communication technologies are concerned. So, nuclear C&I community will have to carefully weigh pros and cons of COTS hardware & software, wireless networks and Internet technologies. For example, the initial excitement of romance with COTS technologies is somewhat diminished by genuine concerns about lack of rigour, lack of verifiability, vulnerability to malware, IPR theft, restrictive IPR regimes, unpredictable licensing policy, high obsolescence rate and vulnerability to proliferation politics. Above constraints will set the context as the Nuclear C &I systems leverage the latest advancements in sensors, architectures, processors, computation and development platforms, networks, software, diagnostics and HMI technologies.

This article surveys the emerging technologies in each of the above areas and assesses their impact on availability, safety and security. Newer technologies will also impinge on regulatory framework, principles and practices as has been happening over the previous decades as computers

and software based systems made gradual inroads in to the safety island.

## 2. Sensors and Instruments

Motivations of improved accuracy, speed and stability along with reduced maintenance and drift drive the development of sensors. Some of these developments will offer interesting options to regulators and utility operator – reduced operating margins and more time between test intervals. Increased computation / communication capability at the sensor level has large positive impact on accuracy, stability, noise rejection, multi-sensor fusion, calibration, diagnostics, maintainability and cost. But the central questions regarding V&V, safety, independence and unmodelled failure modes need to be addressed. The increased concerns about the presence of malicious logic in Integrated circuits requires new R&D as well as policy initiatives.

## 3. Communication Technologies and Networks

Proprietary networks and protocols have most definitely given way to industry wide acceptance of standard network components to form the back bone of Nuclear C &I. This trend is likely to strengthen even though malware and intrusion concerns will put a break on the speed and depth of penetration to the safety island. Wireless networks is the technology to watch; however real concerns on availability, jamming and security remain to be addressed satisfactorily.

## 4. Processors, Computation platforms and Software

Microprocessors have advanced in computation power enabling software implementation of many functions earlier done in hardware. This also makes possible multiplexing of diverse functionalities in a single platform. FPGAs are replacing generic microprocessors in many applications to enhance re-configurability. Most of code is generated by tools running on desktops such as Windows PC. Systems of different safety relevance often have channels of communication between them to support testing, diagnostics, surveillance and data logging. Each benefit brings along attendant risks and new challenges. The increased complexity of semiconductors makes verification impossible; bugs do remain in microprocessors. Operation at high speeds demands higher heat dissipation with potential hot spots; reduced operating voltages degrade noise margins; high speeds may also accept more noise in to the system than desirable. Multiplexing opens up possibility of common cause failure modes and proof of independence becomes harder and often intractable. Reconfigurability impinges on configuration management. The initial joy felt by the C&I community by the flexibility offered by the PC based

\* Shri YS Mayya, presently C&MD, ECIL, pioneered the development & deployment of Distributed Systems in Nuclear Reactors & Allied Plants, Computer Controlled Servo Systems for the Giant Metre Wave Radio Telescope array, vehicle mounted UAV trackers, Antenna Platform Unit for LCA Multi-mode Radar, Stabilization System for Active Radar Seeker for missiles and Antenna Control Servo System for the 32 Metre DSN Antenna of Chandrayaan-I Programme



development / engineering / operator interface platform (often networked) have been replaced by caution. The development framework used to generate code is much more complex than the generated code itself. Generated code borrows a lot of library code from the development environment- the developer is often not explicitly aware it.

The tools and platforms have a shorter shelf-life. They are prone to all kind of attacks. Proof of correctness of software embedded in a safety system is still elusive. In the meantime testing and verification processes supported by tools are used to provide assurance on the integrity of safety software. To augment this, code generation is increasingly being automated – whole industry of high integrity software has sprung-up. This pushes the frontier to verification of the tool itself. Taking in to account the nature and causes of majority of software errors, diversity as a design principle to mitigate common cause faults in software systems is still a valid proposition.

### 5. Diagnostics and Surveillance

It is in the area of diagnostics and surveillance that increased automation bolstered by newer sensors, software, networks and processing power have a large potential impact in terms of reduced down time, increased test/ calibration intervals, prognostics and enhanced safety. However, issues which need to be addressed relate to increased likelihood of common cause failure modes, likely loss of independence between systems of different safety significance and likelihood of residual faults due to the sheer complexity of such a system calling in to question the validity of the diagnosis especially when human operator is kept out of the loop.

***ECIL is an active participant in wider national efforts to build-up component industry, trusted platforms, secure networks & encryption technologies***

### 6. Indian Scenario

The Indian Nuclear C&I industry is largely home grown and has kept pace with the technological developments due to the continuity provided by the domestic Nuclear program. It has successfully negotiated generations of C&I technology spanning four decades and multiple type of reactors viz. PHWRs, FBRs and PWRs. The introduction of programmable / software based systems, networks and distributed systems was done in carefully calibrated stages, learning precious lessons on the way. Preponderance of home grown bespoke systems as against standard PLCs, DCS or SCADA – often necessitated by embargos but primarily as a conscious policy decision- promoted rigorous verification regimes and attenuated impact of obsolescence both in commercial and technological terms. Most importantly, a well informed C&I community of experts is built up in the country encompassing

a vast landscape of in-depth skills in all aspects of the enterprise-specification, analysis, modelling & simulation, design, engineering, manufacturing, qualification, quality control, testing, erection, commissioning, operation, maintenance and refurbishment- in short from cradle to grave. Standards, procedures, guidelines, practices, systems and processes have all evolved to a mature state.

Project management and regulatory functions have got institutionalized. Equally importantly, an eco system of support industry has come-up in the country. There are significant gaps in the domestic C&I technology fabric, however. The mirage of sustainable manufacturing base for electronic components, semiconductors and sensors continue to elude us. The preponderance of COTS technology brings in new dependencies – in software, platforms and networks. Fortunately, skills and knowledge base are not the limiting factors. Large national level efforts and policy initiatives are necessary to bring together experts and entrepreneurs on a common platform. The experience

of Indian Nuclear Industry is unique in many ways. India has well developed Nuclear industry with mature technology base. There is an opportunity to be an international player - to export our technology and products. However, the gradual demise of domestic industries in the area of components, telecommunication, computers and entertainment electronics should be an eye opener. Indigenous technologies have to be preserved at all costs. It is easy to loose these gradually to the dazzle of imported

technologies, as surely these are expected to enter the Indian scene. So, Indian Industry should not be looking at only kit based manufacturing opportunities or labour intensive installation/ erection piece of the C&I pie. Here is an opportunity for the Indian Industry to stake claim for the upper echelons of the value chain.

ECIL has been the torch bearer of Indian Nuclear C&I industry for four decades now and has managed to develop, absorb and productionize generations of C&I technologies for the Nuclear island. The company has mounted an ambitious program for the development of radiation detectors and nuclear instruments for whole gamut of applications encompassing reactor instrumentation, health physics instrumentation, environmental monitoring, security, safeguards and material accounting. Efforts are underway to develop a qualified PLC as work horse of future nuclear C&I systems. ECIL is an active participant in wider national efforts to build-up component industry, trusted platforms, secure networks and encryption technologies.

# An overview of Atomic Spectroscopy Techniques

Dr S.Suresh Babu \*



## Introduction

Atomic Spectroscopy has experienced remarkable growth and development in the past few years, making it more difficult for analysts to keep up with developments in the field. This article is prepared to provide a quick reference to the various Atomic Spectroscopy techniques and how they can be used to solve analytical problems. There are three different techniques of Atomic Spectroscopy. These are Atomic Absorption (AA), Atomic Emission (AE) and Atomic Fluorescence (AF). Of these Atomic Absorption and Atomic Emission are the most widely used and this paper deals with these techniques.

## Atomic Absorption

Atomic Absorption is the process that takes place when a ground state atom absorbs energy in the form of light of a specific wave length and is elevated to an excited state. The amount of light energy absorbed at this wave length will increase as the number of atoms of the selected element in the light path increases. The relationship between the amount of light absorbed and the concentration of Analyte present in known standards can be used to determine unknown concentrations by measuring the amount of light they absorb. Instrument read outs can be calibrated to display concentrations directly.

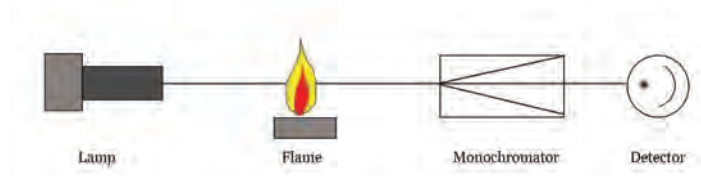


Figure 1. Schematic of flame AA Spectrophotometer

The basic instrumentation for atomic absorption (Figure 1) requires a primary light source, an atomiser, a monochromator to isolate specific wavelength of light to be used, a detector to measure the light accurately, signal processing electronics and a data display or logging device to show the results. The light source used is either a hollow cathode lamp or an electrode-less discharge lamp.

The atomiser used must produce free analyte atoms from the sample. The source of energy for free atom generation is heat, most commonly in the form of an air acetylene or nitrous oxide acetylene flame or a graphite furnace. The sample is introduced as an aerosol into the flame and as a liquid or solid into the graphite furnace. The flame burner head or furnace is aligned so that the light beam passes

through the flame or graphite tube where the light is absorbed. For mercury and other hydride forming elements, the hydride generation with atomic absorption technique is used for enhanced detection limits.

## Atomic Emission

Atomic Emission are of two types Flame Emission and Inductively Coupled Plasma Emission.

## Flame Emission

Atomic emission spectroscopy is a process in which light emitted by excited atoms or ions is measured. The emission occurs when sufficient thermal or electrical energy is available to excite a free atom or ion to an unstable energy state. Light is emitted when the atom or ion returns to a more stable configuration or the ground state. The wavelengths of light emitted are specific to the elements which are present in the sample.

The basic instrument used for atomic emission is very similar to that used for atomic absorption with the difference that no primary light source is used for atomic emission. One of the more critical components for atomic emission instruments is the atomiser, because it has to provide sufficient energy to excite the atoms as well as atomise them.

The earliest energy sources for excitation were simple flames. Later, electro thermal sources such as arc/spark systems were used, particularly when analyzing solid samples. These sources are extremely useful for doing qualitative and quantitative work with solid samples. But these are expensive, difficult to use and have limited applications. Air-acetylene and nitrous oxide acetylene flames were also used, but often lacked sufficient thermal energy to be truly effective sources. The most advanced source used for atomic emission is the Inductively Coupled Plasma(ICP), which does not exhibit many of the problems associated with earlier emission sources and thus has caused a dramatic increase in emission spectroscopy utilization.

## Inductively Coupled Plasma Emission (ICP-AES)

The ICP-AES is an argon plasma maintained by the interaction of an RF field and ionized argon gas. In ICP the temperatures reach as high as 10,000°C, with the sample experiencing useful temperatures between 5500°C and 8000°C. These temperatures ensure complete atomization of elements, thus minimizing chemical interference effects.

\* Dr Suresh Babu has been associated in development of Analytical Instruments development, application support and business development for the last 17 years. His other areas of interest include CBRN & Medical Electronics."

The plasma is formed by a tangential stream of argon gas flowing between two quartz tubes, as shown in the Figure 2. Radio Frequency (RF) power is applied through the coil, and an oscillating magnetic field is formed. The plasma is created when the argon is made conductive by exposing it to an electrical discharge which creates seed electrons and ions. Inside the induced magnetic field, the charged particles (electrons and ions) are forced to flow in a closed annular path. As they meet resistance to their flow, heating takes place and additional ionization occurs. The process occurs almost instantaneously and the plasma expands to its full dimensions.

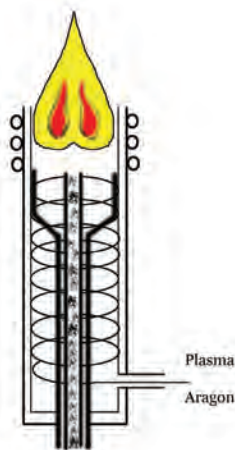


Figure 2. ICP torch assembly

When viewed from the top, the plasma has a circular, “doughnut shape”. The sample is injected as an aerosol through the center of the doughnut. This characteristic of ICP confines the sample to a narrow region and provides an optically thin emission source and a chemically inert atmosphere. This results in a wide dynamic range and minimal chemical in analysis. Argon is also used as a carrier gas for the sample.

### Selection of Atomic Spectroscopy Technique

With the availability of several atomic spectroscopy techniques such as flame atomic absorption, graphite furnace atomic absorption and inductively coupled plasma emission, the role of scientists have become very critical to decide which technique is best suited for their application. Because atomic spectroscopy techniques complement each other so well, it may not always be clear which technique is optimum for a particular application. A clear understanding of the analytical problem and the capabilities provided by the different techniques is necessary. Important criteria for selecting an analytical technique include detection limits, analytical working range, sample throughput, cost, interferences, ease of use and the availability of proven analytical methods.

### Atomic Spectroscopy Detection Limits

The detection limits achievable for individual elements represent a significant criterion of the usefulness of an analytical technique for a given analytical problem. Without adequate detection limit capabilities, lengthy sample pre-concentration procedures may be required prior to analysis. Typical detection limit ranges for the major atomic spectroscopy techniques: flame AA, hydride generation AA, graphite furnace AA and ICP emission are shown in Figure 3.

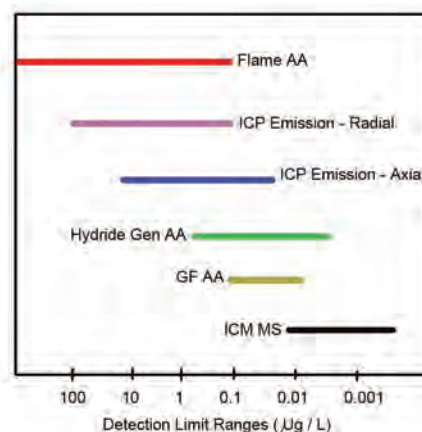


Figure 3. Typical detection limit ranges for the major atomic spectroscopy techniques

### Comparison Summary

The main selection criteria for atomic spectroscopy techniques— concentration range and sample throughput are summarised in Figure 4.

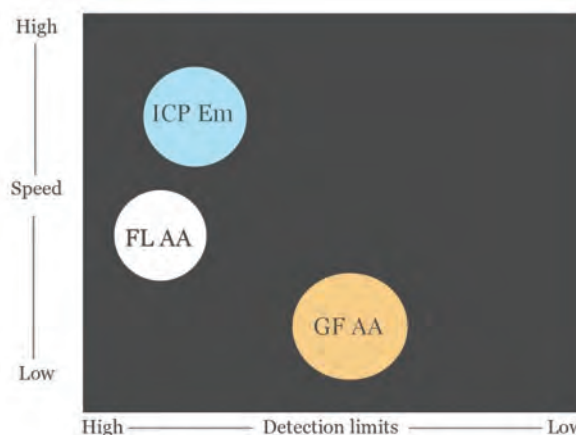


Figure 4. Selection criteria

Instruments and Systems Group of ECIL developed the first indigenous flame AA with the know how from BARC. Today ECIL has field strength of about 800 AAS with a wide spectrum of customers across the country.





A major order was received by ECIL from The Registrar General of India (RGI), Ministry of Home Affairs, Govt. of India for Digitization of Demographic data, Biometric Enrolment and Printing of Local Register of Usual Residents (LRUR) of about 19 crore population.

## 1. Beyond Census

Census of India is carried out once in a decade. Census 2011 was done in two phases – the first phase is called House Listing and Housing Census. The second phase is called Population Enumeration. National Population Register is being built up from the basic data generated from the first phase of Census i.e. House listing and Housing Census. Simply stated, it is an electronic register of all usual Residents of India containing their Demographic and Biometric details. Demographic details include Person's Name, Address, Age, Occupation etc while Biometric details include Person's Photograph, Finger prints and Iris Image.

## 2. Legal Enactment & Framework

The Citizenship (Registration of Citizens & Issue of National Identity Cards) Rule 2003 was notified on December 10, 2003. Rule 2(1) defines "Population Register". It is the Register containing details of persons usually residing in a village or rural area or town or ward or demarcated area within a ward /town / urban area. Sub Rule (4) of Rule 3 mandates The Registrar General of India to prepare a Population Register. Rule 4 specifies the steps to be taken during the enumeration. One of the steps is "house to house" enumeration of 1.2 billion people for collecting specified particulars relating to each family and individual. Hence Creation of NPR is supported by proper Legal framework.

## 3. Unprecedented Exercise

Shri P Chidambaram, Hon'ble Union Home Minister said in an All India Conference of State Coordinators, District Magistrates and Collectors– "Nowhere in the world has a Government tried to count, identify and issue Identity Cards to more than a billion people. This is, perhaps, the biggest exercise of its type since humankind came into existence.

This is the first time a National Population Register (NPR) is being prepared. There are no existing models that the country can emulate. This is a path breaking initiative for others to follow." ECIL is proud to be associated with this path breaking initiative. NPR is a register of Usual Residents and the nationality being canvassed in the Form is only as per the declaration of the respondent. This will not confer any rights of Citizenship on anybody. The emphasis at this stage of Data collection is on inclusion rather than exclusion. The Exercise will involve 35 States /Union Territories 640 districts, 6,08,786 villages, 24 crore households, 120 crore population & 18 languages.

## 4. NPR Process

In the NPR process, details like Name, Date of Birth, Sex, Marital Status, Occupation / Activity, Present address of Usual Residence, Nationality as declared etc had been gathered by designated enumerators (Census people) by visiting each and every house hold. This demographic data has been scanned by RGI's office / Census dept. and encrypted. (Encryption software was developed by ECIL). The data thus scanned in 15 Scan Centres in the form of scanned images is then manually digitized in English and local language at the Bulk data Entry centres of Consortium of Public Sector Undertakings ECIL, BEL and ITI. The Application software for Bulk data Entry in bilingual format has been developed by ECIL. ECIL opened twenty such Bulk Data Entry centres at Andhra Pradesh,

West Bengal, Odisha and Delhi.

The Biometric enrolment (capture of one photograph, 10 finger prints and Iris of both eyes) is carried out, as per UIDAI (Unique Identification Authority of India) Standards and Software practices for all persons aged 5 years and above. For this, camps are being arranged in every village and at ward level in every town. One set of Biometric data is sent to UIDAI for deduplication and Unique ID generation. Second set will be used by ECIL and RGI. LRUR is printed containing basic demographic details and photograph. These Printouts are displayed at prominent places within the villages and wards for objection handling and incorporation of required correction.

***"Nowhere in the world has a Government tried to count, identify and issue Identity Cards to more than a billion people. This is, perhaps, the biggest exercise of its type since humankind came into existence.***

***The task is not easy given the vastness and complexities of our country.***

***This is the first time a National Population Register is being prepared. There are no existing models that the country can emulate.***

***This is a path breaking initiative for others to follow"***

\* Shri Sankar Dey, Dy Project Director (NPR) was actively involved in MNIC Project. He led the NPR teams for Coastal and NPR-57 Projects in West Bengal, Nagaland and Delhi. His areas of interest include Server Consolidation and Management of Large and Unstructured Data Bases





*Inauguration of Bhubaneswar NPR centre for Bolangir Operation by Shri Y S Mayya, C&MD*

Finally the corrected and authenticated data is sent to RGI's office. Subsequently ECIL will receive corrected data and Unique ID from RGI's office. Resident identity Card is issued by the Ministry of Home Affairs. Based on this data Personalisation & printing is being taken up at our Tirupati unit.

ECIL is mandated to execute the job of Demographic data digitization, Biometric enrolment and LRUR printing at A.P, West Bengal, Odisha, Delhi (One district) and Nagaland states covering a population of about 19 Crore.

The impeccable strength of Consortium of PSUs ECIL, BEL and ITI could be foreseen by the then Registrar General of India, Principal Scientific Advisor to Gol and our former C&MD, Shri G P Srivastava. The MNIC Pilot Project, NPR Coastal Village Project, Marine Fisheries Project are the success stories of this Consortium.

## 5. Details of ECIL's Biometric Enrolment Kit

Each kit contains a Laptop preloaded with application software and database, Fingerprint device, Web Camera, Iris Scan Device, Printer and other accessories.



*ECIL's State-of-the-Art Card Personalisation Centre at Tirupati*

## 6. Pilot and Scaleup

Instead of starting full scale operation in all the states, Office of RGI started Bulk Data Entry and Biometric Enrolment in one selected district of each state. Accordingly ECIL started operations for Howrah district of West Bengal, Vizianagram of A.P and Bolangir of Odisha covering a total population of about 88 Lakhs. The single district operation had a successful take off with the inauguration of Bolangir operation at our Bhubaneswar



Centre. Shri Y S Mayya, C&MD inaugurated the Centre. Shri T Ramachandru, Principal Secretary, Dept. of Industries, Govt. of Odisha was the Chief Guest.

Office of the RGI, New Delhi has issued a new order to ECIL for Data Digitization and Biometric Enrolment for the State of Nagaland. The Biometric Enrolment operation was started in presence of Dy Director General, Office of the RGI on 3rd March, 2011 with the data of Chief Minister of Nagaland. As of now, the process of Census Data Digitization in Bulk Data Entry Centre is completed. The process of Biometric Enrolment is on.

On 21st January, 2012, Hon'ble Union Home Minister, Government of India distributed the NPR Cards produced in our Tirupati Unit among the residents of a selected village of Andaman & Nicobar Islands in presence of Shri Y S Mayya, C&MD, ECIL.



## Indian Nuclear Society INSAC 2011

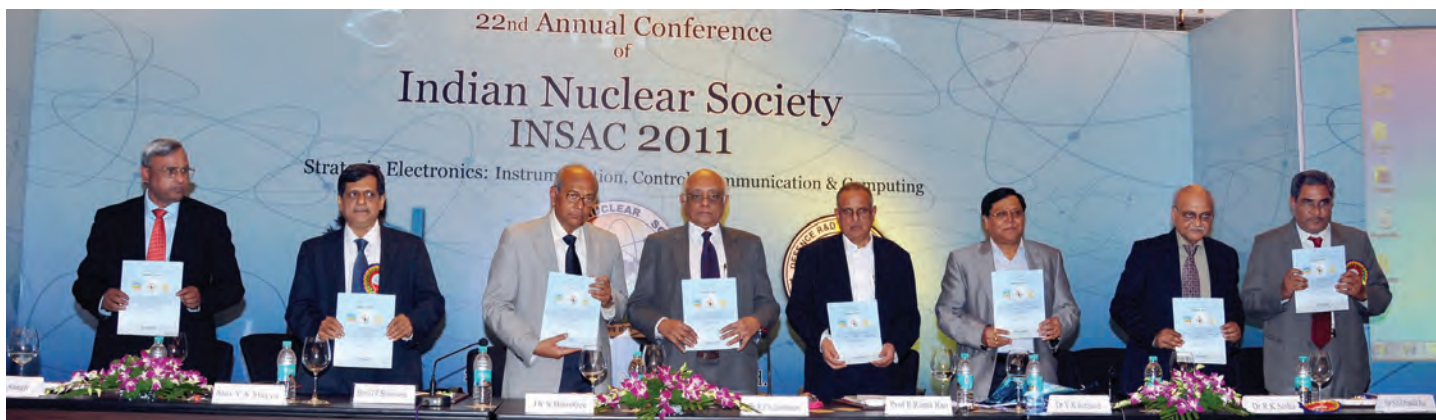
The 22nd National Annual Conference INSAC-2011 was held at Hyderabad from 24 to 26 November, 2011.

Theme of the Conference was "Strategic Electronics: Instrumentation, Control and Communication and Computing". ECIL played a key role in conducting the conference successfully.

The conference highlights advances in Strategic Electronics with focus on applications in Nuclear, Defence, Aero-space, Security and Telecom sectors. Strategic Electronics in India rests on the strong foundations of indigenous R&D built by the national laboratories and industry. Eminent experts were invited to deliver talks on selected topics and brought out the developments in their areas of expertise. The advances stimulated by indigenous

A well informed community of experts with a vast range of in-depth skills in all aspects of the enterprise participated in the conference. The evolution of matured state of standards, procedures, guidelines, practices, systems and processes was presented. The conference highlighted that, though the project management and regulatory functions have got institutionalised, the ever increasing need for speed, precision, high availability and ruggedness in electronic systems coupled with steep rise in complexity pose challenges which can be met only by close synergy among academic community, R&D centres and industry.

The eminent speakers elaborated on the unprecedented opportunities opening up in India for the rapid growth of strategic electronics sector which can be further leveraged to develop home grown products and IP.



*Shri R K Singh, Shri Y S Mayya, Dr Srikumar Banerjee, Dr P Chidambaram, Prof P Rama Rao, Dr V K Saraswat, Dr R K Sinha and Shri N S S Prasada Rao during the release of the INSAC 2011 Souvenir*

Nuclear Program in instrumentation, controls, computers and robotics encompassing reliability engineering, fault-tolerant architectures, failure mode studies, device qualification including radiation hardening, trusted platforms, verification technologies and tools were highlighted.

Also, in striving towards self-reliance in defence and aerospace systems, the efforts underway in many national laboratories in design and development of strategic electronics systems and equipment for remote sensing, aeronautics, armaments, combat vehicles, communications, EW systems, missiles and naval systems were brought out. The significant achievements in the areas of Radar, Radio, Sonar systems, Seeker and Navigation systems, Electronic Warfare Systems etc were enumerated during the conference. In addition, the continuing development in advanced areas such as Directed Energy weapons, High Power Microwave devices, LPI Radar and Phased Array Antennas. Similarly, Security Electronics and Telecom Equipment form vital components of strategic infrastructure were vividly presented by the speakers.

The scientists, engineers and academicians shared their experience and insight on the vital role of Electronics, Instrumentation and Computers in all such systems.

The distinguished guests of the event were  
Dr K Kasturirangan, Dr R A Badwe, Shri G P Srivastava,  
Prof S V Raghavan, Dr M Y S Prasad, Prof S K Koul,  
Dr K D Nayak, Shri P Subramanyam, Dr R Sreehari Rao,  
Shri C K Pithawa, Shri P R Hannurkar, Shri Satheesh Reddy,  
Shri S Varadarajan, Shri I V Sharma, Shri Rahul Chowdhry,  
Shri Umesh Chandra and Dr Gulshan Rai





## Our Esteemed Visitors



*Maj Gen Vikas Joshi, ADG Arty (A) visiting  
Fuze manufacturing facility at SPD*



*Shri S Basu, Chief Executive, NRB, BARC flagging  
off the MCR Control panels for P3A project*



*Air Cmde T G Desai, VSM, PDSI (AF) discussing with  
Cmde L M Khanna, GM, CNSG, ECIL on M7 Radios*



*Dr S Kailas, Director, Physics Group, BARC witnessing the  
progress of MACE proof assembly at ASG*



*Shri V V Bhat, Member (Finance), Atomic Energy Commission and  
Space Commission & Ex- officio Secretary to the GoI discussing on  
new business opportunities with our Senior Executives*



*Maj Gen P M Cariappa, VSM, Addl. DGSI being briefed on  
MACE Project by Shri Ch V R S Gopala Krishna, ED, ECIL*



*Smt K Kamala Kumari Hon'ble Member  
National Commission for Scheduled Tribes  
in discussion with our Directors*



*Smt Latha Priya Kumar Hon'ble Member  
National Commission for Scheduled Castes  
in discussion with our Directors*



## Major Events

The Valedictory Function of GET Batch 2011 and Inauguration of GET Batch 2012 were held on 25.10.2011 at Nalanda Complex, ECIL. A structured training programme for GETs at the entry level was launched in the year 2010. The duration of the training programme is 6 months. During the first 4 months GETs undergo classroom training followed by project work in the divisions for 2 months. In addition to ECIL's own faculty, experts from BARC, NFC, DRDO, NPCIL, IGCAR, ISRO, BSNL and C-DAC have also taught the GETs. Batch 2012 will be completing the training course by middle of May 2012.



*Dr Srikumar Banerjee, Chairman AEC & Secretary DAE and Shri Y S Mayya, C&MD, ECIL with GETs of 2012 batch at the Inaugural Function*



A MoU between BDL and ECIL was signed by Maj Gen Ravi Khetarpal, VSM (Retd.), C&MD, BDL and Shri Y S Mayya, C&MD, ECIL at ECIL. The MoU facilitates the two PSUs to synergise their core competencies and work together as preferred associates to address major defence programmes. The MoU would be operational for a period of five years. The missile check out facility for Akash missile, designed and developed by ECIL was handed over to BDL prior to signing the MoU.



Shri G P Srivastava, Director E&IG, BARC inaugurated the Advanced Network Technology Evaluation Lab along with Shri Y S Mayya, C&MD ECIL. The Lab is equipped with heterogenous Routers, Core/ Distributed / Access Switches, IP-PBX and other network and communication systems and can be used to demonstrate / POC for Audio / Data / Video / Wireless communications. It can be used as a Test Bed for all the inhouse developed products like Access / BEU / IP Encryption products. It facilitates training personnel in configuring the network parameters.





Hon'ble Union Home Minister, Shri P Chidambaram launched the first Resident Identity Card (RIC) under the coastal National Population Register (NPR) Project in Andaman & Nicobar Islands on 21.01.2012. Registrar General of India, DDG (NPR), ORGI and C&MD, ECIL graced the occasion. The RIC is a Contact Smartcard with a 64-KB secure Microprocessor chip having resident's demographic and biometric data.

RIC incorporates several physical security features like guilloche patterns, hot stamped hologram, micro text and e-security. The cards are personalised at Tirupati Unit.

Compact Antenna Test Facility (CATF) was inaugurated by Dr R K Sinha, Director, BARC in the august presence of Dr Sri Kumar Benerjee, Chairman AEC & Secretary DAE on 24th November 2011. Senior scientists from BARC including Shri G P Srivastava, Director, E&IG graced the occasion. CATF is established for the R&D and Production/Test requirements of antennas especially with regard to slotted array, phased array, flat plate, HPM and UWB and the primary feeds.

The test range has facility to measure parameters such as primary feed amplitude and phase patterns, secondary radiation patterns, gain etc. This supports the design, development, fabrication, test & characterisation of diverse products such as VSAT Antennas, antennas for BARC Anunet, MMR for LCA, Seeker Antennas of Project AD, High Power Microwave (HPM) and Ultra Wide Band (UWB) research required by BARC.



Shri R Krishnan, Executive Director, BHEL, Hyderabad flagged-off the consignment of Unit Control Panel for Recycle Gas Compressor for Tabriz Oil Refining Company, Gasoline Production Plant, IRAN.

Shri Y S Mayya C&MD and Shri P Vishwanth, GM, CSG were also present on the occasion. This fully pressurized panel meets NFPA 496-1982 and IS 7389-2004 standards and is certified by CIMFR. Built with a dual redundant SIL3, TUV certified Programmable Logic Controller (PLC) along with SOE recording, HMI screens with touch screen monitors, Woodward speed governing system along with 2003 protection, bearing temperature/vibration measuring system for turbine/compressor and various other controls of the compressor.



## Congratulations



*Dr Ratan Kumar Sinha, Director, BARC took over charge from Dr Srikumar Banerjee*

Dr R K Sinha, Director BARC has assumed charge as Chairman AEC & Secretary DAE on 30.04.2012. Dr Sinha is internationally recognized as an expert in nuclear reactor technology. He is one of the architects of India's futuristic 300 MWe Advanced Heavy Water Reactor (AHWR) which will use Thorium as fuel. He has designed and developed the Indian High Temperature Reactor for using hydrogen which is termed as "the fuel of the future". He has designed, developed and installed the coolant channels and other internal components of world class Dhruva (100 MWt) reactor at BARC, Trombay.

ECIL conveys hearty Congratulations and Best Wishes to Dr R K Sinha on this occasion.

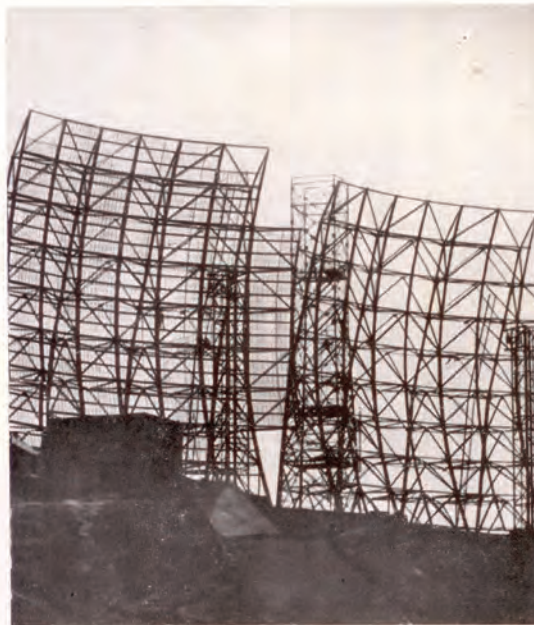
## Down Memory Lane

### EC NEWS

HOUSE MAGAZINE OF  
THE ELECTRONICS  
CORPORATION OF  
INDIA LIMITED  
HYDERABAD-500 762

Vol. 9 No. 1 Jan. / Feb. 1978

#### ECIL TO EXPORT MEMORY STACKS, ANTENNAE



**TROPO SCATTER ANTENNA :** ECIL will be supplying two such 30 meter by 30 meter tropo scatter antennae with associated feeds for the proposed Indo-USSR tropo communication link between Srinagar and Dushanbe in the Soviet Union. The tropo-link, one of the longest in the world with a path distance of 695 kilometers, will provide for direct communication between India and USSR without the aid of a satellite.

Our Corporation has secured two prestigious export orders from the Soviet Union for the supply of computer memory stacks and tropo scatter antennae.

##### COMPUTER MEMORY

ECIL will supply 1350 sophisticated ferrite core memory stacks valued at Rs. 3.65 crores to the Soviet Union over a period of two years. These memory stacks will be integrated into Russian computer systems. The first consignment will be delivered to the USSR by the end of 1978.

##### ANTENNA EXPORT

The antenna export order, valued at Rs. 59.00 lakhs, envisages ECIL to supply two 30 meter by 30 meter parabolic tropo scatter antennae with associated feeds. The antennae, which will be used for setting up the proposed Indo-USSR tropo scatter link between Srinagar and Dushanbe in the Soviet Union, will be designed and fabricated by ECIL using wholly indigenous knowhow.

##### TROPO LINK

The Indo-USSR tropo scatter link, one of the longest in the world with a path distance of 695 kilometers, will provide for direct communication between India and USSR without the need for a satellite. At present, communication between the two countries is through satellite.



## हिन्दी कार्यशाला



इलेक्ट्रॉनिक्स कारपोरेशन ऑफ इंडिया लिमिटेड, उत्तर क्षेत्र, नई दिल्ली द्वारा दिनांक 24.03.2012 को बी-2 कार्यालय के सम्मेलन कक्ष में हिन्दी कार्यशाला का आयोजन किया गया। इस कार्यशाला का उद्देश्य भाग लेने आए सभी कर्मचारियों को हिन्दी साफ्टवेयर यूनिकोड के प्रयोगिक ज्ञान की जानकारी देना था। कार्यशाला में विभागाध्यक्षों के अतिरिक्त कुल 15 कर्मचारियों ने भाग लिया।

सर्वप्रथम सचिव ने सभी का स्वागत किया। उन्होंने सभी को सम्बोधित करते हुए कहा कि पहले यूनिकोड का व्यावहारिक ज्ञान दिया गया था। अब बड़ी स्क्रीन पर इसका प्रयोगिक ज्ञान दिया जाएगा। हर विभाग में कम से कम दो कम्प्यूटरों पर यूनिकोड डालें गए हैं जिससे अधिक से अधिक कार्य हिन्दी में हो सके।

तत्पश्चात अध्यक्ष महोदय ने सभी को सम्बोधित करते हुए कहा कि आज हिन्दी कार्यशाला के आयोजन से हिन्दी कार्य करने में जो भी कठिनाइयाँ आ रही हैं, उन्हें आज आप दूर कर सकते हैं। आज लेपटॉप के साथ बड़ी स्क्रीन उपलब्ध है। अतः आप सभी पूर्ण तत्परता से अभ्यास करें। उन्होंने कहा कि यह कार्यालय “क” क्षेत्र में होने के कारण हमें 100% कार्य हिन्दी में करना है।

पावती हिन्दी में भेजने के साथ-साथ पत्रों के आरम्भ व अन्त हिन्दी में आवश्यक लिखें। यह सहजता से सम्भव हो जाएगा कुछ विभाग सरलतापूर्वक यह कार्य कर भी रहे हैं। सभी इस बात का ध्यान रखें कि तिमाही रिपोर्ट में कार्य की प्रतिशतता बढ़नी चाहिए। उन्होंने कहा कि अगले माह सभी विभागों द्वारा पूरे वर्ष में किए गए हिन्दी कार्य का निरीक्षण होगा तथा अधिक कार्य करने वाले विभाग को पुरस्कृत किया जाएगा।

इस के पश्चात सभी को पढ़ने के लिए इनसिप्ट साफ्टवेयर की फोटोस्टेट सामग्री दी गई। श्रीमति चित्रा बुद्धिराज ने लेपटॉप को स्क्रीन्से से जोड़ कर इनसिप्ट कुंजीपटल की जानकारी दी। फोटोस्टेट में इसका चित्र बना हुआ था। इसके वर्णों तथा मात्राओं की जानकारी दी। इसमें एक ओर सभी मात्राएँ तथा दूसरी ओर सभी वर्ण हैं जिससे इनका प्रयोग सरलता से किया जा सकता है। संयुक्तक्षरों की जानकारी दी गई। हलन्त का प्रयोग करना सिखाया गया जिससे किसी भी वर्ण को आधा लिखा जाता है। फिर उन्होंने शब्द बनाने सिखाए। श्रीमति इन्दु सोनी ने भी सभी को शब्द बनाने का अभ्यास कराया। सभी ने बारी-बारी स्क्रीन पर अभ्यास किया। श्रीमति चित्रा बुद्धिराज ने लेपटॉप द्वारा हिन्दी में ई-मेल लिखकर भेजना भी सिखाया। अन्त में सहायक सचिव ने सभी का धन्यवाद कर कार्यशाला का समापन किया।

### We Miss You Nori Garu



Shri Shiv Kumar Nori, our beloved Director (Finance), passed away on 26<sup>th</sup> April, 2012. ECIL fraternity mourns the untimely death of Nori Saab. Shri Nori joined ECIL on 16<sup>th</sup> June, 2008 as General Manager (Finance) and became Director (Finance) on 21<sup>st</sup> July, 2010. Before joining ECIL he worked in Public and Private Sector companies in different capacities. These include Ocean Sparkle Limited, Mir Liquid Brewing India, BHPV and BDL. He was a learned person and acquired many academic qualifications including B.Com., LL.B., CA and Company Secretary.

Shri Nori Garu is survived by wife, daughter and son. We pray almighty to give strength to his family members at this hour of crisis. ECIL extends all support to his family in overcoming grief and loss.

*May his soul rest in peace*



## Free Medical Camp Organised by ECIL Corporate Social Responsibility (CSR)

ECIL organised a "Free Medical Camp" at Cheekatimamidi village, Bommalaramaram Mandal, Nalgonda District on Sunday, the 11th March, 2012 as part of its Corporate Social Responsibility initiative. The unique feature of this camp was the use of a high tech medical van for consultations by NIMS specialists via satellite.

The Medical Camp was inaugurated by Shri Y S Mayya, C&MD, ECIL and Dr Dharma Rakshak, Director, NIMS was the Guest of Honour. Dr Srinivas Rao, Arogya Sree Coordinator, Nalgonda District & Shri Chandramouli, Chairman, Marketing Committee, Cheekatimamidi village also spoke eloquently on the occasion.



*Dr Dharma Rakshak speaking on the occasion*

The Medical Camp was a huge success and over 700 people from Cheekatimamidi village and neighbouring thandas got Blood Tests, ECG, Kidney, Cancer Tests for Women, Eye, Dental and Orthopaedic tests done by specialist doctors who were present at the camp. Some of the patients were given reports through Medical consultations from NIMS specialists via Satellite with Mobile Medical Van.



*Dental Services at the Camp*

The VIPs who participated in the Camp were Maj Gen Sanjeev Loomba, Director (Personnel), Shri NSS Prasada Rao, Director (Technical), Shri Shiv Kumar Nori, Director (Finance) from ECIL along with Dr Srinivas Rao, Arogya Sree Coordinator, Nalgonda District & Shri Chandramouli, Chairman, Marketing Committee, Cheekatimamidi village.



*Shri Y S Mayya, C&MD inaugurating the Medical Camp*

ECIL has taken a major Corporate Social Responsibility (CSR) initiative and besides the Free Medical Camp, is supporting education by providing educational infrastructure, class room dual desks, computers and computer literacy in eight Government schools in the vicinity of ECIL. It has already committed close to Rs. 1.8 Crores for CSR activities for the year 2011-12 and about Rs.2 Crores is planned for the next financial year 2012-13.



*Free Medicines being distributed at the Camp*



*Maj Gen Sanjeev Loomba, Director (Personnel) and his team at the Medical Camp*