Day 1: 16th December 2011:

The Inaugural Ceremony of the INDICON 2011 commenced at 1700hrs at the BITS-Pilani Hyderabad Campus with the arrival of His Excellency Shri E. S. L. Narasimhan, Governor Andhra Pradesh and Dr. Fakir Chand Kohli, FIEEE, Former Deputy Chairman TCS and the lighting of the lamp by the dignitaries. Mr. M G P L Narayana, Chairman IEEE Hyderabad Section and General Chair, INDICON 2011 delivered the welcome address followed by a brief talk on IEEE India by Dr. Ram Gopal Gupta, Chairman, IEEE India Council and about IEEE by Dr. Gordon W. Day, 2011 IEEE President-Elect. 2012 IEEE President-Elect Dr. Peter Staecker spoke about IEEE in general followed by the Prof. B. N. Jain, VC-BITS Pilani speaking about the BITS Pilani mentioning the credentials and achievements of BITS Pilani and Prof. V. S. Rao, Director BITS-Hyderabad spoke about the BITS-Pilani Hyderabad Campus emphasizing on the laurels achieved by the students and faculty members of the BITS-Pilani Hyderabad Campus. Later Dr. F C Kohli addressed the gathering giving a brief history of IEEE in India stating that it was first started as a pilot activity in IIT-Kanpur in 1967 and then based on the success of this pilot activity, the first IEEE Section in India the IEEE Bombay Section was formed. Then, His Excellency Shri. E. S. L. Narasimhan released the INDICON 2011 Souvenir and addressed the delegates. He spoke about the theme of the INDICON 2011 which is “Engineering Sustainable Solutions” giving a few pointers to maintain environmental equilibrium and how to engineer
sustainable solutions to cater to the same. He discussed the significance and importance of technology stating that “Advancement of technology made the world a global village”. He then mentioned the limitations and adverse effects of technological advancements and urged that every innovation or technological development should be accompanied by their counter measures in order to avoid the misuse of the innovation. Shri. Narasimhan concluded quoting Kautilya’s famous aphorisms from his Arthashastra. The Inaugural Session concluded with the Governor unveiling the INDICON 2011 Logo, presentation of mementos to the dignitaries and a vote of thanks by Mr. Maruthi Pathapati, Organizing Committee Secretary INDICON 2011 & Treasurer, IEEE Hyderabad Section.

Earlier during the Day 1 of the India Council three-day Annual Conference INDICON 2011 (16th – 18th December, 2011) commenced with sessions of tutorials and workshops on plethora of topics pertaining to the fields of Electronics, Electricals, Software Engineering, Nanotechnology to name a few. The morning session comprised of parallel sessions of three tutorials and a workshop and the post-lunch session comprised of four tutorials, a workshop delivered by
eminent experts from both the academia and industry and three special sessions.

The workshop “Achieving Product Success in Electronic Product Development” was handled by Dr. S. Goshal, Mr. Gopi Kumar Bulusu and Mr. Ramdas Rajagopal together. During the course of the workshop, Dr. Goshal, National Institute of Design spoke about the Innovative User Interface Design that would give better results while developing latest consumer electronic devices like the mobile internet devices. Following Dr. Goshal’s talk, Mr. Gopi Kumar Bulusu of Sankhya Technologies Pvt. Ltd. spoke enthralled the audience with the principles of system application of system level design to consumer electronics and the use of platforms like Teraptor. Later Mr. Ramadas Rajagopal, Magma Design Automation India Ltd. spoke about how to tape out complex SoC designs for consumer electronics giving real life examples. A hands-on session led by Dr. Gohsal was also held where the participants were divided into teams of 4-6 and were asked to design a simple product.

The second session a tutorial on “Big Data Management” by Dr. Santhosh Kumar Mohanty, Mr. Jayant Dani, Mr. Srikar Chilakamarri of Tata Consultancy Services where they introduced the concept of “Big Data” along with the opportunities and challenges that one might come across were discussed. The architecture for the “Big Data Management’ was demonstrated using the Hadoop technology with Map-Reduce framework and its Open Source ecosystem. The third parallel session was a tutorial on “Smart-Grids for
Transmission Systems” by Prof. S. A. Soman, IIT-Bombay. Prof. Soman during his talk primarily focused on innovations in system operations and improving efficiencies of the power markets through regulatory reforms and introducing new mechanisms for trading power.

The final pre-lunch session was on “Adaptive Software Engineering Design” by Mr. Hari Prasad Devarapalli and Ms. Padmalata Nistala of Tata Consultancy Services. The tutorial mainly focused on the various SDLC models, the current challenges in coping with change and the quality imperatives in solution design and delivery life cycle. Other concepts such as the various product quality aspects in design such as security, reliability, scalability, usability, agility and affordability etc. were also discussed.

The post lunch session comprised of a workshop, four tutorial sessions and two special sessions held in parallel. The workshop on “Dispelling the myths of Innovation” by Dr. Prasad Vemuri, Former Advisor to the CLIC, ISB, Hyderabad briefed the participants about the common myths related to Innovation in general. For the participants to better understand these myths, a hand-on session was held where the teams of participants were given case studies of various such myths and their facts and later were asked to present their observations and comments on those myths.

The second session was a tutorial on “Power Electronic System: Digital Control Solutions” by Prof. M. Veerachary, IIT-Delhi. Prof. Veerachary spoke briefed on the role of power electronics systems, their applications, limitations of conventional controllers and the importance of digital controllers while presenting DC-DC converter problems using MATLAB, SIMULINK and PSPICE models as examples. The third parallel tutorial was on “Nanotechnology” by Dr. V. Ramagopal, IIT-Bombay. He introduced the concept of Nanotechnology stating its applications and mainly focusing on CMOS Scaling in Nanoelectronics and the various Bottoms-up approaches of CMOS Scaling.
The post-lunch session on the “IEEE Standards Association” by Mr. Harish Mysore (Director, IEEE India Office), Mr. Sri Chandra (Chair, IEEE Standards Interest Group), Dr. John Walz (2012 President, IEEE Computer Society) and Mr. Satish Aggarwal (SK Nuclear, Maryland). The session primarily focused on the role of IEEE Standards Association with a special attention to standards from Indian perspective, Standards related to areas related to Smart-Grid, ICT, Nuclear Engineering, Software Engineering, etc. Ms. Jennie Steinhagen, Global Strategy Manager, IEEE elaborated on the mission and vision of the IEEE Standards Association (IEEE-SA) with a brief introduction. Later, Dr. John Walz spoke about the IEEE Standards Development Process and the Technical society Standards development process. Mr. Satish Aggarwal then discussed the Nuclear Power Engineering in detail mention the IEEE Nuclear Power Engineering Committee (NPEC) and its principles, policies and standards.

Day 2: 17th December 2011:

Day 2 of INDICON 2011 comprised of parallel technical sessions of diverse fields such as Computing, Power and Energy, Communications and the theme of the INDICON 2011 i.e., Engineering Sustainable Solutions (ESS) throughout the day. A plenary session and a few invited talks by eminent experts and speakers from various fields were also arranged. The technical sessions started at 0930hrs on 17th December, 2011 with each track divided into various sessions having about 8 papers to be presented.

The first plenary session on “Advancing Technology for Humanity: Expanding the Reach… and the Toolset” by Dr. Peter Staecker, 2012 IEEE President Elect. Dr. Staecker briefed on the various Humanitarian activities that happened with in IEEE commending the Indian volunteers who worked for this cause. He also stated that as a follow-up of these activities and to cater for the cause, the IEEE Board of Directors initiated a Humanitarian Ad Hoc committee that would report the progress of its activities which were organized for the first 9 months since initiation and the report would include programmatic elements such as Articulating an IEEE mission in the humanitarian activities area and Developing an administrative structure, operating plan and information and
dissemination plan to support IEEE’s humanitarian activities past 2011. Dr. Staecker also mentioned that the scope of the programme will be expanded substantially by examining and aligning other related activities within IEEE, and through our collaborative partners in the Engineering for Change (E4C) portal. He also mentioned that the IEEE would report case studies of present and future technologies that are actively deployed in humanitarian activities and the vigour and purpose that is shared by participants and sponsors.

The post-lunch session consisted of a dialogue session/poster presentation of few of the accepted technical papers running in parallel with the oral technical sessions and the invited talks. The talk was in the area of computing on “Biometric Security” by Dr. Venu Govindaraju. The talk mainly focused on the tasks of verification and identification using fingerprints and face recognitions as examples. Dr. Govindaraju spoke about the smart environments such as the computing and communication sensors which are further classified as Possession based schemes such as the id cards and Knowledge based schemes such as the passwords. He then spoke about the Biometric identification process of the Sense – Reason – Act cycle and about the secured smart spaces. He also covered the concept of surveillance using biometrics, the Universal ID (UID), various modalities of biometrics such as the handprints, thermal prints, 3D face, ear, keyboard typing, dental, way of walking, speech and Iris & retina prints to name a few. He mentioned that the iris scan is proved to be the most accurate and fastest method for biometric identification. Dr. Govindaraju then discussed the concept of UID in detail stating is characteristics and advantages. He then mentioned the Heuristic rules in Biometrics and briefed about fingerprint spoofing.

The second talk was on “Structural Sub-band Decomposition: A new concept in digital signal processing” by Dr. Sanjit Mitra in which he discussed various aspects of DSP, structural and polyphase Subband decomposition and its matrices. He then elaborated on Subband Discrete and Cosine Fourier Transforms and designing of FIR and IFIR filters and
their implementations. The third talk on “Energy Needs – Future Strategies” by Dr. M. Ramamoorty primarily focused on the potentials of non-conventional sources of energy abundantly available to be harnessed from the environment around us. He elaborately discussed the advantages and limitations of the non-conventional sources of energy and the methods employed to tap this energy for effective use.

**Day 3: 18th December 2011:**

The day 3 of the INDICON saw even more technical presentations in both the oral and dialogue sessions. The delegates enthusiastically presented their work and attended the plenary sessions and invited talks arranged. The second plenary talk of INDICON 2011 was on “Information Extraction from Sensory Signals” by Prof. Hynek Hermansky, John Hopkins University Baltimore, Maryland. Prof. Hermansky during his talk introduced the concept of signals with giving their basic definitions and applications. Later he spoke on the various techniques and methods used for machine learning for information extraction from given signals briefing about the concept of Automatic Recognition of Speech (ASR), architecture of the system used for ASR, spectrogram, etc.. He later spoke of Linear Discriminant Analysis (LDA), spectral sensitivity of projections, RASTA processing of signals mentioning that the combination of channel and signal spectrum should be as flat as possible for effective suppression of noise in communication systems.

A panel discussion on “Engineering for Global Development” by Engineering for Change (E4C) was organized prior to lunch panelled by eminent professionals from various sectors and organizations. This panel discussion provided the delegates an opportunity to interact with the panellists and clear their doubts/ queries related to Engineering, its humanitarian approach and for the advancement of technology leading to global development. The discussion also focused on organizations, corporates and universities can collaborate, form alliances and cater to the necessity of diversified approaches to solve real-life problems that
the present engineers face while applying the theory to get a solution.

The post-lunch session comprised of the dialogue and oral sessions for remaining papers and the last set of invited talks in each of the tracks. The talk in the computing track was on “Cloud Computing: A New IT Model for Delivering Sustainable Solutions” by Dr. Rajkumar Buyya of Manjrasoft Pvt. Ltd., Melbourne. During his talk Dr. Rajkumar presented the 21st century vision of computing identifying various paradigms to deliver this vision. He then spoke about the architecture of the market-oriented Clouds emphasising on the resource management strategies related to the customer-driven service management and computational risk management. He discussed in detail about the applications of Cloud Computing in the areas of engineering, gaming and health care.

The communications track talk was on “Communication Networks” by Ms. Tessy Thomas, Scientist DRDO. She during her talk elaborated on the secured communication networks used in military and strategic communications, multiple information gathering and data-fusion, auto updation of databases, threat analysis and real-time decision making using advanced algorithms and techniques using Battlefield management as one of the real-time applications as an example. The Electrical track talk was on “Grid Operations and Control – Issues, Concerns and Expectations” by Mr. M. G. Raoot, MD & CEO NPEX. His
presentation briefly covers the issues and challenges in real-time operation of Indian Electricity Grid. He mentioned that the system operation of the grid becomes more complex with the multi-fold expansion of the grid and for its reliable and secure operation, the operator must fully understand the challenges involved in the expansion.

The three-day INDICON 2011 concluded with the valedictory ceremony presided over by Dr. Gordon W. Day, IEEE 2012 President-Elect addressing the delegates on “Let us flatten the world”. Dr. Day in his talk spoke about the various effects on technology and how it helped the world evolve into a “Global Village”. Following Dr. Day’s talk, Dr. John Walz, President IEEE Computer Society 2011 spoke on how fundamental knowledge in computer science in a must in the present-day scenario. Later the certificates for the best papers in both oral and dialogue sessions were presented by Dr. Walz. The best papers were awardees are:

- **Computing Track:** “Promoter Prediction using DNA Numerical Representation and Neural Network: Case Study with Three Organisms” by Swarna Bai Arniker et al for Dialogue session and “Numerical Algorithm for the Solution of Third Order Differential Equations in Orthogonal Hybrid Function (HF) Domain” by Anindita Ganguly et al for Oral session.

- **Communication Track:** “A Compact Fractal UWB Antenna with Open-ended Quarter Wavelength Slot for Band Notch Characteristics” by Anirban Karmakar for Dialogue session and
“Simulation of Vertical Handover between WiFi and WiMax and its Performance Analysis – An Installation Perspective” by Sahana Bhosale for Oral session.

- **Power and Energy Track:** “Laboratory implementation of Feedback Linearization Control Based Power Control of Grid Connected DFIG” by Karthikeyan Anabalagan and team for Dialogue session and “Effects of Low Amplitude Oscillatory Switching Transients on EHV Grid Transformers” by Poulomi Mitra and team for Oral Session.

- **Theme Track – Engineering Sustainable Solutions:** “Decision Support Information System for water source evaluation and management” by Valli Kumari Vatsavayi and team for Discussion session and “Flood Control- Mesh and X-Ray Fluorescence Spectroscopy based system for city drainage” by Swati Padmanabhan and Anaisha Jaykumar for Oral session.

The INDICON 2011 theme video contest award was presented to Equinox team from Vignana Bharati Institute of Technology, Ghatkesar. Later, sponsors for their support, the session and track chairs of the conference, BITS-Pilani Hyderabad Campus for providing the venue and enthusiastic volunteers, Violet Worldwide for their efforts in making the event a grand success and the INDICON 2011 Organizing Committee – the IEEE Hyderabad Section all other volunteers associated with the event were felicitated. The INDICON 2011 concluded with the Mr. M. G. P. L. Narayana, General Chair INDICON 2011 and Chairman IEEE Hyderabad Section passing on the baton to Mr. Satish Babu, Chairman IEEE Kerala Section. Mr. Satish Babu invited all the participants to INDICON 2012 to be held at Kochi in December 2012 jointly organized by the IEEE Kerala Section and IEEE Cochin Sub-section.