

K L University
Department of Electrical & Electronics Engineering
International Conference on Smart Electric Grid -2014
Proceedings Report

An International Conference on Smart Electric Grid, an absorbing theme of research in Power Systems, has been organized by the Department of Electrical and Electronics Engineering of K L University, Vaddeswaram in Andhra Pradesh during Sept. 19-20, 2014. The conference was co-sponsored by the IEEE Hyderabad section.



The conference Chairman was Dr. M Ramamoorthy, a former professor of IIT, Kanpur and former Director-general of CPRI, Bangalore who also worked as research chief of A.B.B. and Director of ERDA. Prof. S.S. (Mani) Venkata, who till recently was at the Washington State University and now with Alstom Grid NMS in U.S.A. was the Chairman of the Technical Committee. There were eminent academicians from India, U.S. and Canada on the Technical and Advisory Committees with Dr. M Venu Gopala Rao, Head of EEE Department of K L University as the conference Coordinator.

The conference received over 200 research papers; they are all reviewed and screened by eminent professors from IITs, NITs and large Universities. On this two-day conference, 56 papers, selected by reviewing committee, were presented in eight technical sessions by delegates drawn from eleven states in India. Based on the themes, the sessions were entitled:

- Power Converters
- Solid State Drives
- Power Quality
- System Operation
- Data Acquisition and Analysis

- Distributed Generation
- A T C and Power Flows
- System Stability and Protection

Present at the inaugural function were the Chief Guest Dr. Subir Sen of Power Grid Corp. of India, Dr. S.S. Murthy, Prof.(retd.) IIT Delhi and now Professor of Eminence and Academic Adviser to PES University, Bangalore along with Dr. M Ramamoorthy and Dr S.S. (Mani) Venkata and the Vice-president of K L university Sri K. Raja Harin, Chancellor Dr. R Sreeharirao, Vice-chancellor Dr. L.S.S. Reddy and the principal of the university engineering college Dr. A. Anand Kumar.



In his introductory remarks Dr. M Ramamoorthy, who conceptualized the conference, wished the delegates well and spoke of the genesis of the conference and the importance of the theme of the conference in the Indian scenario. The coordinator Dr. M Venu Gopala Rao introduced to the delegates the details off technical sessions, the screening procedure adopted and of the eminent guest professors invited to participate.



Dr Subir Sen, the Chief Guest at the function, addressed the large gathering of conference delegates on the theme of Indian power scenario which included consumption trends in India, issues of renewable sources and their integration and new technical initiatives like high technology transmission corridors.

Dr. Sen felt that smart grid is the backbone of realization of smart cities and discussed the attributes of smart grid which include advanced metering infrastructure, outage management systems, peak load management, integration of renewable sources, micro grid, electric vehicles and energy storage devices. Giving the details on the Indian power scenario, he mentioned that the total installed capacity in India at present is 249 GW of which coal amounts to 59.5%, hydro by 16.3%, renewables by 12.7% and nuclear by 1.9% with a growth rate of 8.9%. He talked about the volatility of renewable and how this can be managed through flexible generation, energy storage, demand response, DSM and smart grid.



Dr. S.S.(Mani) Venkata, in his Key-note address spoke at length on **Advanced Distribution Automation (ADA)**. The main objectives of ADA are:

- Improved system efficiency, reliability, security, power quality and safety.
- Improved outage restoration time
- Improved customer service options
- Smart metering to enhance fault location and to use remote controlled switches
- Integration of Micro Grid with Main Grid
- Integrated outage management
- on-line 3-phase unbalanced power flow and fault analysis
- Communication and energy infrastructure integration.



New technologies are needed to achieve the above goals; one of them is the second generation DMS, the integrated Distribution Management System (IDMS). IDMS integrates the Outage Management Systems (OMS), DMS and SCADA and others in to one seamless function. Integration of Micro Grid with utility system will yield higher reliability and resilience.

He talked in detail on the following topics:

Benefits of ADA to utilities

ADA ensures energy savings and capacity release (MW) due to reduced losses. It also saves man-power and labour due to reduced patrol and manual switching time. The unserved energy is reduced because the power is restored more quickly for most customers. ADA assists in achieving real-time price targets for outage duration.

Benefits to Customers

ADA reduces loss in manufacturing and increases productivity. It also reduces the need for new materials for industrial production. It minimises cost of running private generators.

The Barriers

Anticipated advances will remain limited until system data are available from a much wider area in near real-time. There is also lack of broad consensus for modern grid vision among stake holders while the state regulatory bodies do not fully support the vision for modern grid. At present the cost of sensors is too high and the infrastructure for integrated communication is missing.

Disciplines needing immediate attention

- Smart grid basics
- Cyber and physical security
- Power quality and reliability
- Communications and computing psunami
- Micro grid markets
- Resiliency
- Sensors and other new technological data.

The outstanding feature of the conference is the series of plenary addresses by eminent academicians. The three speakers are:

- ❖ Dr. S.S. Murthy, Professor (Retd.) IIT, Delhi and now Professor of Eminence and Adviser, PES University, Bangalore,
- ❖ Dr. N. Murugesan, Director-General, C P R I, Bangalore
- ❖ Dr. R. Balasubramanian, Professor (Retd.) I I T, Delhi and Chairman, IEEE PES Joint Chapter of Hyderabad Section.

In the plenary address Dr, S S Murthy had the theme ‘Make Conventional Energy-Sustainable and Renewable Energy- Available’. He emphasized the need for personal power plants. An agile power system will let every home and business generate, store and share electricity. The current energy crisis is leading to climate change and the need of the hour is clean alternative energy. The International Energy Agency’s 450 scenario proposes to reduce the energy-related CO₂ emissions to 450 parts per million by the year 2030 which may limit the global warming to just 2⁰C. In the year 2000, global energy production was at a level of 2548 kWh per capita. At present two billion people in the world do not have access to electricity. By the year 2020, the total energy must increase by 60% to cover the entire population. How do we go about this increase. One of the methods is Decentralized Distributed Generation (DDG).

India is investing \$ 250 billion for DDG for rural electrification using alternate energy.

Dr. N Murugesan of CPRI in the second plenary address spoke of the rising costs of capital, raw material and labour, increasing awareness of environmental issues, growing demand for energy, rising consumer expectations and need for his participation and rapid innovations in technology and felt that smart grid can be a good solution to meet these demands. Energy Independence and Security Act of 2007 guides the global electricity planners in right direction in to the future.

Prof. M Balasubramanian gave the third plenary lecture. He talked about the issues related voltage stability aspects in deregulated operation of distribution systems using ANN methods.

Another most rewarding milestone of the conference was the brain-storming panel discussions chaired by Dr M Ramamoorthy in the presence of other participating experts. The theme of the discussion was ‘ Scope, relevance and need for Smart Grid for countries like India’ The issues open for discussion were:

- In the light of huge deficit for power forced by many factors, should we rectify this situation before going for modernization.
- Can the poor performance of the power sector be attributed to the public indiscipline and lack of integrity
- Should we improve the public awareness about their responsibilities before implementing the concept of smart grid
- Will the demonstration project planned by Govt. of India on Smart Grid provide the necessary knowledge to utilities and the public on the necessity for modernization
- Is it desirable to implement the Smart Grid activity in steps
- Should the example set up by some private power companies in Thane District of Maharashtra be tried by all DISCOMS.



The discussion highlighted the poor energy scenario in the country, electrical losses, theft of energy, poor power restoration time and public awareness of the energy crisis. The members felt that consolidation is the need of the hour and that modernization towards Smart Grid can only go in steps. The Smart Grid needs public participation in system operation and their awareness at present is not adequate.



It is felt that modernization leading to Smart Grid should first be introduced in power distribution networks in university campuses, industrial organizations and large commercial establishments; these are the places where the load and network data are available easily and customer awareness is good. After having had experience of operating the smart grid at these selected places attempts may be made to take this technology to large towns and cities.

Go slow and steady to win the smart grid.

At the valedictory function the participation certificates were distributed. The organizers felt happy at the excellent feedback received from the delegates on the conduct of the conference.

Participant's photos:



Certificates Issue photos:



Feedback photos:



Vote of Thanks:



After the valedictory function, Mr. D. Seshi Reddy Associate prof. EEE Department proposed a vote of thanks to all those who worked for the conference from day one till the closing function.