AICTE sponsored

Online Short-Term Training Program (STTP) on

"Smart Grid Technologies for Energy Efficiency and Active Demand Side Management"

Phase No	Date		Title
	From	To	
1	07 December 2020	12 December 2020	Introduction to Smart Grid Technologies; Opportunities and Challenges in Future world – Case Studies

Summary Report

Organized by

Department of Electrical and Electronics Engineering

NEW HORIZON COLLEGE OF ENGINEERING
New Horizon Knowledge Park, Ring Road, Marathalli
Autonomous College Permanently Affiliated to VTU, Approved by AICTE & UGC
Accredited by NAAC with 'A' Grade, Accredited by NBA

Department of Electrical and Electronics Engineering

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1	07 December 2020	12 December 2020	Introduction to Smart Grid Technologies; Opportunities and Challenges in Future world – Case Studies
2	04 January 2021	09 January 2021	The role of Smart Grids on Loss reduction and rural electrification.
3	01 February 2021	06 February 2021	An overview of Smart Grid Infrastructure for Demand Side Management.

Summary Report

Phase I - Introduction to Smart Grid Technologies; Opportunities and Challenges in Future world – Case Studies

(7th Dec 2020 to 12th Dec 2020) AICTE Sponsored online Short-Term Training Program On "the SMART GRID TECHNOLOGIES FOR ENERGY EFFICIENCY ACTIVE DEMAND-SIDE MANAGEMENT" was inaugurated on 07.12.2020. Dr. M. Mahesh, HoD/EEE, New Horizon College of Engineering welcomed the participants and guests. He mentioned that attending the program like this is essential for the faculty members to understand the needs of industry and implement the strategies in teaching learning process. He also Emphasized the importance of smart grid, energy management, energy efficiency and demand-side management.

Power controllers for wind energy conversion system in smart grid
Dr. K. Vijayakumar, Professor, IIITDM, Kancheepuram

Dr. **K. Vijayakumar, stressed the role of power controllers in wind energy systems in smart grid during his session on 07.12.2020. In his address, how renewable energy systems such as wind, solar, etc. can be connected and integrated to the grid and the necessity of power controllers in smart grid.**

Voltage Stability Monitoring and Control in Smart Grid Architecture Through Synchrophasor Measurements

Dr. Mitresh Kumar Verma, Professor, IIT, Varanasi

Although the concept of smart meters providing information about the grid has been present for years, quality of measurements and reporting rates of these devices have proven to be inadequate for maximizing utilization of transmission assets, as well as foreseeing blackouts and brownouts. Synchrophasor on the other hand, provide a much better insight into the state of the smart grid and in turn help optimize grid efficiency and stability.

Smart IED's and Evolution of Communication Protocols in T&D Substations

Ms. Anuradha Charugalla,

Senior Test Engineer, OSI Systems, Hyderabad

Integrated communications protocols will allow for real-time control, information and data exchange to optimize system reliability, asset utilization, and security. Areas for improvement includes substation automation, demand response, distribution automation, SCADA, energy management systems, wireless mesh networks and other technologies, power-line carrier communications, and fibre-optics.

Security and Privacy Issues in Smart Grid: Cyber Physical System Approach

Dr. Sofana Reka, Sr Assistant Professor, VIT Chennai.

The development of a trustworthy smart grid requires a deeper understanding of potential impacts resulting from successful cyber-attacks. Estimating feasible attack impact requires an evaluation of the grid's dependency on its cyber infrastructure and its ability to tolerate potential failures. A further exploration of the cyber-physical relationships within the smart grid and a specific review of possible attack vectors is necessary to determine the adequacy of cybersecurity efforts.

Control of inverters in Microgrid with distributed battery energy storage

Dr. M Kowsalya, Professor, VIT Vellore.

When the MG operates in distributed battery energy storage, a critical control task is to maintain voltage and frequency in the AC microgrid, with several inverters working in parallel and sharing load. The classic droop control technique, typically applied to electromechanical synchronous generators, can be applied to inverters coupled with the microgrid through mainly inductive impedance.

Smart Grid Technologies: Future of Indian Power System

Dr. Hitesh D. Mathur, Professor and Head, BITS Pilani.

Since the early 21st century, opportunities to take advantage of improvements in communication technology to resolve the limitations and costs of the electrical grid have become apparent. Technological limitations on metering no longer force peak power prices to be averaged out and passed on to all consumers equally. In parallel, growing concerns over environmental damage from fossil-fired power stations has led to a desire to use large amounts of renewable energy.

Power Converters in Smart Grid Technologies

Dr. S. Senthil Kumar, Associate Professor, NIT Tiruchirappalli.

The advent of modern power electronics has brought tremendous impact on smart grid, besides the usual industrial applications to improve productivity. Power converters is possibly the most important element in modern smart grid and renewable energy systems. Electronic power conditioning and control of the production and distribution of electricity are important aspects of the smart grid.

Intelligent Power Control Architecture for Distributed Energy Resources Effective Power Management

Dr. Rajendra Kumar Pandey, Professor, IIT Varanasi.

In recent years, the Intelligent Power Control Architecture has been established as one of the most popular distributed energy platforms to effectively manage the coordination and communication among the power electronic inverters in islanded microgrids. A multi-agent-based control strategy for EV integrated energy system is proposed in to manage the sharing of powers within the system.

Power Quality Enhancement with Shunt Active Power Filters

Dr. Amit Sant, Assistant Professor, Pandit Deendayal Petroleum University, Gandhinagar.

In recent years, power electronics devices have evolved, and used for varies applications. Also, this device caused the problem of power quality in electrical system. In the utility side arc furnaces, variable frequency drives (VFD), personal computer, fluorescent lamp such non-linear load produces current harmonics. The active power filter which is capable for improving the power quality and reactive power compensation.

Smart Building Energy Systems

Dr. V.S.K.V. Harish, Assistant Professor, Pandit Deendayal Petroleum University, Gandhinagar.

Smart buildings use information and communication technologies (ICT) to enable automated building operations and control. They can enhance occupants' comfort and productivity while using less energy than a conventional building. Whereas conventional buildings have systems operating independently, smart buildings use ICT to connect building systems together to optimize operations and whole-building performance

Recent challenges, innovations, and advancements in Smart Grid Technology

Dr. Balakrishna P, Senior Lead R&D Engineer, GE Grid Energy, Hyderabad.

With the advancement in technology, there is an immense increase in the demand of electrical energy that has not only become challenge for its production but also its distribution. So this rising demand is growing the complexities of power grids by increasing requirement for greater reliability, efficiency, security and environmental and energy sustainability concerns. These feature in a power grid towards smartness which eventually known as a today's concept of "Smart Grid".

Virtual Power Plant (VPP)/Microgrid

Dr. Debapriya Das, Professor, IIT Kharagpur.

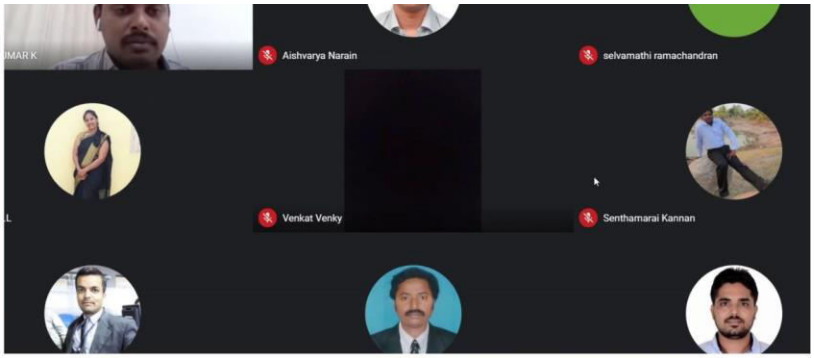
A virtual power plant works remotely to combine a number of independent energy resources from disparate locations into a network that provides reliable power 24 hours a day. Relatively new on the energy scene, the plants employ software-based technology that relies on the smart grid. They utilize planning, scheduling, and bidding of distributed energy resources (DER) to create the network that provides this reliable power.

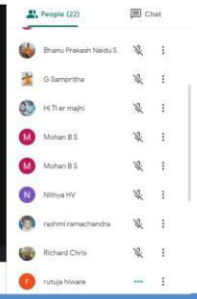
Vote of Thanks by Dr. A. Singaravelan.

A big 'Thank You' to all resource persons for their efforts towards the AICTE Sponsored online Short Term Training Program On "the SMART GRID TECHNOLOGIES FOR ENERGY EFFICIENCY ACTIVE DEMAND SIDE MANAGEMENT". I am thankful to all participants for attending the STTP. I also extend my thanks to Chairman, Principal, HoD and organizers for their cooperation and support.

Glimpses of Phase I

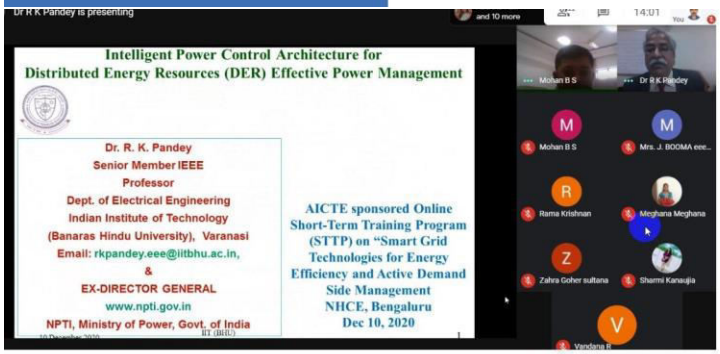
DAY 1





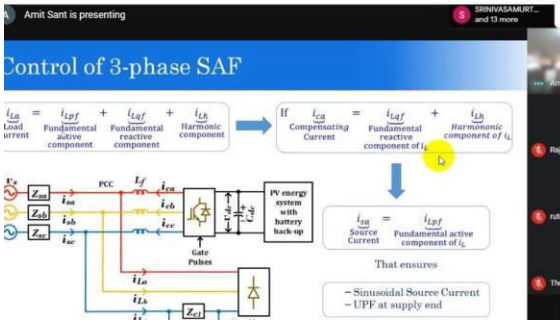
DAY 2

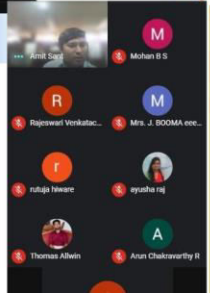
DAY 3



DAY 4

DAY 5





DAY 6