Department of Electrical and Electronics Engineering
Koneru Lakshmaiah Education Foundation
Vaddeswaram, Guntur, India

May, 2020

Organizing Team

Program Chair:

Dr. S. V. N. L. Lalitha, *Professor & Head, Dept. of EEE, K L E F*

Convenor:

Dr. J. Somlal, *Professor, Dept. of EEE, K L E F*

Co-convenor:

Dr. K. Narasimha Raju, *Professor, Dept. of EEE, K L E F*

Coordinators:

Mr. D. Kalyan, *Asst. Professor, Dept. of EEE, K L E F*

Mr. S. Ravi Teja, *Asst. Professor, Dept. of EEE, K L E F*

Mr. M. Naga Chaitanya, *Asst. Professor, Dept. of EEE, K L E F*

Challenges in Micro-grid Protection

Resource Person:

Dr. S. V. N. L. Lalitha,
Professor & Head, Dept. of EEE, K L E F.

Day 1 (06.05.2020):

On the day 1, protection challenges posed due to the integration of distributed energy sources is discussed. Micro grids are miniature version of conventional large power grids functioning either autonomously or with inter connection to the main grid. Primary function of micro grid is to serve power at distribution level. Distributed energy resources (DERs) connected to the micro grid enables reliable and efficient operation of micro grid. Protection of micro grids assumed importance due to increased penetration of distributed energy resources. Most of the distribution systems in earlier days are radial in nature and protection systems are designed for that.

Day 2 (07.05.2020):

Followed by day 1, Limitation of the conventional protection scheme and new insights and methodologies for micro grid protection are discussed. Due to intermediate current injection from DERs the conventional coordination of over current (O/C) relays is not possible. Further in meshed systems the fault current flow is bidirectional. Hence the protection of micro grid systems with DERs require different approach to ensure faults are cleared in less time and minimal number of consumers connected to the system are affected. A comprehensive analysis of the suitable techniques applicable for micro grid protection is presented in this session.

Total participants registered : 664

Total participants attended : 337

Total certificates issued : 337

Challenges in Restructured Power Systems

Resource Person:

Dr. P. Srinivasa Varma,
Assoc. Professor, Dept. of EEE, K L E F.

Day 3 (08.05.2020):

On day 3, challenges in restricted power systems are discussed. Concepts of restructured power, challenges, case study on whelling charges are presented.

Various research opportunities in this field of research are furnished hereunder:

Research Areas: (Generation)

- Generation System Reliability
- Risk Assessment and Management
- Generation Scheduling

Research Areas: (Transmission)

- Pricing in Electricity Market
- Transmission Congestion Management
- Ancillary Services Management
- Transmission System Reliability Analysis

Research Areas: (Distribution)

- Demand Side Management
- Distribution System Reliability
- DG Analysis in Microgrids

Base Case Solution:

- Load Flow or Optimal Power Flow

Total participants registered : 690

Total participants attended : 319

Total certificates issued : 319

Design of Power Switching Converters for Renewable Energy Applications

Resource Person:

Mr. M. Sai Krishna Reddy,
Assistant Professor, Dept. of EEE, K L E F.

Day-4 (9-5-2020):

Given overview on power electronics applications and realized the importance of power converters in grid integration. Comparison among AC and DC grids was made and identified the advantages and challenges of DC micro grids over traditional AC distribution systems. Discussed common issues prone in power converters and identified possible solutions for overcoming them

Day-5 (10-5-2020):

Continuation to day 4 webinar, Identified different ways of grid integration, no. of power converter stages involved and different ways of providing isolation, both high frequency and line frequency. Discussed about different dc-micro grid projects taken-up in India and their technical and functional requirements. Also concentrated few key issues on design of non-isolated dc-dc converter.

Day-6 (11-5-2020):

Continued key design issues of non-isolated dc-dc converters. Introduced the need of isolated converters for wide gain by simulating traditional boost converter for identifying drawbacks. Given overview on isolated topologies and shown improved results by simulating them. At last discussed complete block diagram of three phase grid connected PV systems with control structure.

Total participants registered : 814

Total participants attended : 330

Total certificates issued : 330

An Overview on Battery Management Systems for Electric Vehicles

Resource Person:

Dr. K. Narasimha Raju,
Professor, Dept. of EEE, K L E F.

Day-7 (12.05.2020):

Given overview on the classification of Electric Vehicles, Battery evolution. It also dealt with the battery pack formation, battery cell specifications, battery specifications for pack and important specifications for EV.

Day-8 (13.05.2020):

Followed by day 7, principles of conventional batteries, principles of Li-ion battery are discussed on this day. Li-ion battery components and materials used, classification of Li-ion batteries based on cathode materials, comparison of various battery chemistries are also discussed.

Day-9 (14.05.2020):

In day 9, Role of battery management systems in electric vehicle is discussed. The topics included necessity of BMS, construction of BMS, functions of BMS.

Day-10 (15.05.2020):

Followed by day 9, Battery modelling is discussed in day 10. It includes simple OCV model, R_{int} model, Thevenin model, Hysteresis model, state space model.

Day-11 (16.05.2020):

In this session, model based SOC estimation techniques are discussed. The topics discussed are conventional SOC estimation techniques, Kalman filter based estimation algorithm, extended Kalman filter approach, Sigma Kalman filter approach, hybrid techniques.

Day-12 (17.05.2020):

On day 12, Data driven SOC estimation techniques have been discussed. Advantages of data driven techniques, classification of data driven techniques, comparison of various techniques and neural network approach are discussed in this session.

Total participants registered : 796

Total participants attended : 394

Total certificates issued : 394

Preparation Guidelines for Funded Project Proposals

Resource Person:

Dr. J. Somlal,
Professor, Dept. of EEE, K L E F.

Day 13 (18.05.2020):

In this session, preparation guidelines for funded project proposals is discussed. Various topics discussed in this session are eligibility for submission of project proposals, knowledge domains, and format for research project proposals, budget estimates, and societal benefits. Different Funding bodies that provides finds for researchers in India is also discussed.

Overview on different SERB programs given is also enumerated here under:

- Core Research Grant (CRG)
- High Risk High Reward Research (HRHR)
- Industry Relevant R&D (IRRD)
- Empowerment and Equity Opportunities for Excellence in Science
- Intensification of Research in High Priority Area (IRHPA)
- Start-up Research Grant (SRG)
- MATRICS
- National Post-Doctoral Fellowship (NPDF)
- SPARC
- STRIDE

Total participants registered : 772

Total participants attended : 325

Total certificates issued : 325