

प्रायोगिक संरक्षण रिले स्कूल

“Hands-On Protection Relay School”

फरवरी / February 6-7, 2020



आयोजक / Organised By



विद्युत प्रणाली प्रभाग (पीएसडी)
Power Systems Division (PSD)

केंद्रीय विद्युत अनुसंधान संस्थान / Central Power Research Institute
(भारत सरकार की सोसाइटी, विद्युत मंत्रालय) / (Govt. of India Society, Ministry of Power)

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About the Workshop

Modern power system is required to generate and supply high quality reliable electric power. Any protection scheme is required to safeguard the power system components. The protection scheme basically consists of current transformers, voltage transformers, Protection relay and circuit breaker. The Protection relay functions as a sensing device. It senses the fault through Current/Voltage transformers determine its location and finally it sends the command to the circuit breaker by closing its trip coil. The circuit breaker after getting the trip command from protection relay disconnects the faulty sections from the rest of the power system. Thus, it is seen that the protection relay, which is primarily the brain behind the whole scheme, plays a very important role. This course is aimed at providing theory and practice of Protection Relaying and testing of Generator Protection Relays, Transmission Line Protection Relays, Distribution Protection Relays using Computerized Relay Test System and Real Time Digital Simulator (RTDS). This course also covers advances in modern power system protection and use of computerized relay testing. Reliability is the reason for testing of Protection Relays.



TOPICS:

Module 1: Generator Protection (1 Day, February 6, 2020)

- Introduction to Power system Protection
- Use of Voltage and Current transformers for Generator protection applications
- Generator protection philosophy, schemes and setting criteria
- Generator-Transformer setting criteria
- Numerical Relay technology
- Power System Protection Testing, Standards and Maintenance
- Hands on experience in Numerical Generator Protection Relays (IEDs)

Module 2: Transmission Line Protection (1 Day, February 7, 2020)

- • Use of Voltage and Current transformers for Line protection
- Line protection philosophy, Distance Relay setting calculation
- Numerical Relay technology
- Power System Protection Testing, Standards and Maintenance
- GPS synchronized End-to-End Testing of Distance Protection Schemes
- Synchrophasor for Transmission Systems
- Hands on experience in Numerical Distance Protection Relays (IEDs)

Who should attend?

The workshop is aimed at Engineers, Managers responsible for the operation and maintenance of Renewable Energy Systems, Distribution Systems, Transco's, Discoms, Transmission & Distribution Planners, Consultants, Officers of Power Utilities/Corporations, State Govt./SEBs, Policy makers, Entrepreneurs, Energy Planners, Renewable Energy Providers, Private Entrepreneurs, Manufacturers, Research/Academic Institutions and Financial Institutions, etc.

Registration

Category	Module 1: Generator Protection	Module 2 Transmission Line Protection	All 2 Modules
State Owned Generation/Transmission/Distribution companies/Faculty of academic institutions	Rs 4130	Rs 4130	Rs 8260
Students/Research scholar	Rs 2950	Rs 2950	Rs 5900
Public & Private Industries and organizations	Rs 5900	Rs 5900	Rs 11800

The no. of delegates will be limited to 20 - 25 for each module. Registration form, a part of this brochure, complete in all respect shall be sent to the programme coordinator along with the registration fee in the form of crossed DD drawn in favour of Accounts Officer, CPRI, payable at Bangalore.

Participants from international may transfer the fee via Swift code No.: SBININBB425, SBI A/C No. 10270577483, and participant from National may transfer fee to SBI A/C No.10356553310, IFSC code: SBIN0002215. Beneficiary Name: SBI, IISc Branch, Bangalore under intimation to the workshop coordinator.

Kindly use separate form for each participant, Downloaded/ Photo copies of Registration form are acceptable. The Registration fee includes kit, training material, tea/coffee with snacks and working lunch.

Travel & Accommodation

Bangalore is well connected by Road, Rail and Air.

Participants have to make their own travel arrangements.

Guest house accommodation on twin share basis can be provided on chargeable basis subject to availability

Power Systems Division (PSD)

Power Systems Division with its state-of-the-art facilities and latest software tools offers a wide range of power system simulation services, including real time performance analysis of various types of controllers such as FACTS, HVDC, SVC and protection relays. It has been conducting power system studies for the past two decades for its own needs and at the request of utilities and manufacturers. To carry out such studies the division possesses

Real Time Digital Simulator (RTDS), RT Lab and various Power System Analysis Software Packages. Power Systems Division has carried out for the first time in the country the pilot project on “Protection system study and Protection audit” of selected DTL transmission system. Furthermore the Division is accredited by ISO: 9001-2015.

The Relay Testing Laboratory (RTL) is equipped with sophisticated Computerized Relay Testing Systems for testing of Protection relay for all its characteristics/functions meeting its accuracy requirements as per IS:3231 series and IEC:60255 series of standards. The laboratory conforms to ISO/IEC 17025-2017 requirements. Field-testing of protection relays is also carried out for major power stations and utilities and also undertakes pre-dispatch Third Party Inspection (TPI) on Relay and Control panel.

Central Power Research Institute, Bangalore has established **country’s first** Phasor Measurement Unit (PMU) test facility. Fluke make 6135A/PMUCAL Phasor Measurement Unit Calibration system is an automated system and is traceable to International reference standard. It's a unique facility for carrying out Validation/Evaluation of PMU both M-class and P-Class steady state and Dynamic conditions as per IEEE C37.118.1-2011, IEEE C37.118.1a-2014, IEEE C37.242.2013, IEEE Synchrophasor Measurement Test suite Specification-Version 2-2015 and IEC/IEEE 60255.118.1:2018.

6135A/PMUCAL at a Glance

The 6135A/PMUCAL system enables you to:

- Calibrate and test a PMU from a client PC, either at the site of the test system or remotely over the Internet
- * Quickly set up a PMU test
- Speed through automated calibration procedures
- * Provide the required static and dynamic voltage and current conditions that occur in a power distribution grid specified by the standard
- * Apply those signals to a phasor measurement unit
- * Capture the PMU's reported results
- * Compare those results with the original stimulus
- * Evaluate against the thresholds defined in IEEE Std C37.118.1a™-2014 & IEC/IEEE 60255-118-1:2018
- * Create test reports, graphs and calibration certificates that can be readily printed or shared electronically



CPRI'S Profile

Central Power Research Institute (CPRI) set up in 1960 by the Government of India, functions as a National organization for applied research in power sector and also serves as an Independent Laboratory for testing and certification of power equipment. CPRI is a member of STI (Short Circuit Testing Liaison) of Europe and is accredited by M/s ASTA of UK. CPRI also provides consultancy services on various facets of power sector. CPRI has expertise in the area of Simulation, Diagnostics, System Analysis and Testing. CPRI laboratories have modern equipment needed for Power system simulation, Short circuit testing, Diagnostics of equipment, Materials engineering, Seismic qualification etc. CPRI has experienced faculty in different subjects concerned to power sector with practical experience in their areas of interest, as well as extensive experience in presenting courses/seminars.

Over the period, CPRI officers have gained lot of practical knowledge concerning to testing and operational problems of the industry. CPRI is a leading provider of Training and Continuing Education to Utilities, PSUs across the country for the past 50 years. CPRI is continually setting new standards in training and continuing education from basic theoretical information to practical hands-on electrical equipment training. CPRI courses have made substantial impact on the level of training and education to India's electricity utilities, manufacturing companies, transmission and distribution companies. By upgrading the occupational skill of technical workers, CPRI training courses have improved the career path of many electrical personnel as well as contributed to an improvement in electricity efficiency, plant productivity, electrical system reliability an overall competitiveness of Indian industry.

Registration form shall be sent by E-mail/Fax/Post to
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Programme Coordinators



Shri Kaliappan Perumal, B.Tech., M.E., (Ph.D). He has 25 years of experience with CPRI working in the field of Power System Protection, Synchrophasor, Wide Area Monitoring, Protection and Control (WAMPAC) and Smart Grid Technology and Applications. His areas of interests are Adaptive Relaying, Computer Relaying, Protection issues in Distributed Generation, Validation of Phasor Measurement Unit, Synchrophasor for Power system Protection and Control applications, Internet of Things with Renewable Energy, Internet of Things with Smart Grid, Cyber Physical System Security for the Smart Grid. Presently he is Joint Director with Power Systems Division of CPRI, Bangalore. He is an IEEE member as well as member in IEEE PES Bangalore section and he is also pursuing his Ph.D at National Institute of Technology (NIT), Tiruchirappalli. Mobile: +91 94491 49924, Email: kaliappan@cpri.in