Course Objective

The purpose of this course is to give an overview of the function of an electrical power distribution in an electric power system as well as in industrial systems, of its sub-system functions, its planning and design principles. Tools for distribution analysis are derived. Description of the main components of distribution plant will be given to enhance the understanding of their engineering aspects & practical considerations of their selection. At the end of the course, the participant will benefit from having a wider knowledge base and appreciation of the basis of planning and design of a distribution infrastructure system from an experience of actual hands-on exercises conducted during the course.

Course Content

In order to enhance its effectiveness, the course not only contains notes on the topics delivered but also exercises that participants are encouraged to do and discuss during the course.

Duration : 2 days
Time : 9.00 am to 5.00 pm
Venue : Hilton Hotel, PJ/ Armada Hotel, PJ
TRAINERS’ PROFILE

IR. THUM PENG CHEW

BE (Hons) (Malaya), MEng Sc (Malaya), PEng (M), FIEM, MIEEE, MACEM

He joined Universiti Sains Malaysia, Penang as an Electrical Engineer after graduating with a First Class (Hons.) degree in Electrical Engineering from the University of Malaya in 1975. In 1977, he returned to University of Malaya, Kuala Lumpur as a Tutor in Electrical Engineering and concurrently worked for his Master of Engineering Science Degree, which he obtained in 1980 for research on Lightning Protection.

In 1980, he took up an Electrical Engineer’s post with Tenaga Ewbank Perunding (M) Sdn Bhd and rose to the post of Director of Tenaga Ewbank Preece (M) Sdn Bhd in 1990 taking charge of power system studies, transmission and distribution projects, large industrial plants and buildings. His experience covers power system planning and economics, part of which is power system studies, design and implementation of EHV overhead transmission lines, EHV substations, EHV underground & submarine cables and industrial power systems projects. He was involved in the design of the lightning protection system & earthing and the electrical equipment specification for the Petronas Twin Towers, Kuala Lumpur. He is now Director of KTA Tenaga Sdn Bhd and is Head of the company’s Energy Department.

He was also a part-time lecturer in Electrical Power Engineering Practice in the University of Malaya from 1981 to 1990, and has been conducting seminars/workshops for the Institution of Engineers, Malaysia (IEM) and the Association of Consulting Engineers Malaysia on Switchgear, Transformers, Harmonics, Lightning Protection and Earthing. He is an adjunct lecturer in power systems for Universiti Teknologi Petronas, Malaysia. He has published locally and internationally in reputable journals and conferences on the subjects of lightning and power systems. He is the recipient of two IEM awards (1980 & 2001) for outstanding technical papers published in the IEM Journal.

His current interest is in fuzzy system applications, engineering management and evolutionary computing apart from his continuing interest in lightning and power systems.

Who should attend?

For the fresh graduate who is embarking on a power engineering career, the course provides a transitional linkage between the theory and the practice of power system engineering. For the practising graduate engineer in preparation of his/her Professional Interview, the course enhances the understanding and knowledge of power engineering practice, and for the professional engineer, it serves as a continuing professional development course that consolidates his/her practical knowledge by strengthening the practice on a firmer theoretical basis i.e. revisiting relevant theory from the practice point of view. The course is thus open to engineering consultants who are responsible for the planning and design of power distribution infrastructure of new townships and mixed developments, and site engineers & supervisors, contractors, equipment vendors, project owner’s engineers, architect-planners and approving persons who are involved in or wish to have a deeper understanding of the planning, design and building of electrical infrastructure. It is also for the power system engineer who is engaged in utility work or in large industrial plants.
Course Content

Introduction To Power Distribution Systems
A Description of an Electric Power Distribution System, its
Function, Topology and Main Components
• The Electric Power System
• Distribution Systems
• Function of a Distribution System
• Types of Distribution Networks
• Secondary Distribution Substations

Loads and Load Characteristics in Power Distribution Systems
A Description and Derivation of the Loads in the Electric Power System and How they are used for Purposes of Planning and Design
• Basic Definitions
• Load Characteristics
• Load Growth
• Load Estimating and Forecasting

Course Exercise 1

The Analysis of Power Distribution Systems
Basic Principles and Procedures for Planning and Design through Analysis
• Distribution System Planning Process
• Basic Equation for Analysis
• Voltage Drop Calculations
• Power Factor Correction
• Voltage regulation in Transformers
• Short Circuit Calculations
• Induction Motor Starting
• Voltage Fluctuation

Course Exercise 2

Harmonics as a Source of Power Quality Problems
An introduction to Harmonic Effects on power quality in a distribution system and how they can be mitigated.
• Harmonic Quantities
• Sources of Harmonics
• Effects of Harmonics
• Harmonics Limits
• Mitigation Measures
• Design Of Passive Harmonic Filters

Course Exercise 3

Power Transformers
Power transformers as major item of plant, their sizing and specification
• Sizing and Cooling
• Winding Connection, Phase Rotation, Phase Shift and Connection Diagrams
• Vector Group Symbols

• Paralleling of Transformers
• Neutral Earthing Methods
• Tap-Change Operation and Tap-range Calculations

Course Exercise 4

Switching Devices
Switching Devices for the control of power flow and their selection and ratings
• Circuit Breakers
• Switching Characteristics
• Disconnecting Switches
• Contactors
• Gas-Insulated Switchgear

Electric Cables
Cable Construction, their use and Performance
• Main Features and Classification
• Cable Conductors
• Insulation
• Screens
• Metallic Sheath and Armouring
• Outer Sheath Covering
• Causes of Cable failures
• Cable Installation
• Steady State Performance
• Short Circuit Ratings
• Short Circuit Forces

Course Exercise 5

Protection, Instrumentation, Metering and Control
Mitigating the effects of Short-Circuits and methods of reducing short circuit magnitude.
The Causes of Short-Circuits in Equipment and the Provision of Protection
Selection of Protective Equipment, Metering and Control
• Voltage Transformers and Current Transformers
• Protective Relays
• Interlocks
• DC System

Substation Earthing
General Description and Design of Substation Earths
• The Driven Rod and Buried Conductor
• Shock Criteria and Shock Circuits
• Earth Grid Design, Step, Touch and Transfer Voltages

Specifications and Tests
• Tender document
• Specifications
• Technical Particulars and Guarantees
• Factory Tests
• Site Tests
REGISTRATION DETAILS

Registration
To register, please fill in the registration form and return it with your cheque or bank draft in favor of “Comfori Sdn. Bhd.”.

Fees and Payment

<table>
<thead>
<tr>
<th>Participant</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual fee</td>
<td>RM2,500 each</td>
</tr>
<tr>
<td>Group Fee (for three or more participants)</td>
<td>RM2,300 each</td>
</tr>
</tbody>
</table>

Fees must be sent with registration form in advance and include tuition, tea breaks, lunches and course notes.

Once we receive your registration, a place will be reserved for you.

Admission nametag and course notes will be provided at the start of the course.

Time Table
The course starts at 9.00 am and ends at 5.00 pm daily. Lunch at 12.30pm to 1.30pm. In between, there will be two breaks.

How to register
TEL : (03) 5621 3630
(016) 6387 404 (Sheela)

FAX: (03) 5638 8248

E-MAIL: registration@comfori.com

Mail:
Comfori Sdn. Bhd. (581115-T)
Unit CT-04-06, 4th Floor, Corporate Tower, Subang Square, Jalan SS15/4G, 47500 Subang Jaya, Selangor.

For further enquiries:
Please call for more information
(03) 5621 3630

REGISTRATION FORM

ELECTRICAL POWER DISTRIBUTION SYSTEMS

- Please register me to the above course seminar

Mr/Ms/Mrs : ___________________________________________________
Position: _______________________________________________________
Department: _____________________________________________________
Company: _______________________________________________________
Address: _______________________________________________________
______________________________________________________________
Contact person: _________________________________________________
Tel: ____________________________Fax____________________________
Email: _________________________________________________________
Type of Industry: ________________________________________________