ENERGY1
TECHNICAL CONSULTANCY FOR ENERGY & UTILITIES

Claim 12 CDP from Suruhanjaya Tenaga Malaysia

Advanced Electric Motors and Power Transformers

Learn practical methods for specifying, testing, and maintaining two of the most common power system components

10th – 12th July 2017 | Kuala Lumpur, Malaysia

"I have taken over seven sessions like this, and this one was the best by a wide margin. Dr. Fehr is a great Instructor. It is not common to have someone who has real-world experience, a strong academic background, and excellent presentation skills."
Lead Engineer, Electric Utility

"Great instructor! In fact, the best I have worked with."

Engineer, Petrochemical Industry

"The instructor's delivery of the course was one of the best I have seen."

Senior Engineer, Regulatory Agency

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HRDF claimable

Suruhanjaya Tenaga
Energy Commission

ST (IP/PPTKP/DSM)16/35/16(12)(JKPTST 240217)

Advanced Electric Motors and Power Transformers – Selection, Application, Testing & Maintenance (3 Days)

Transformers and induction motors are essentially the same – they have identical equivalent circuits and many of the same issues and concerns. This course will expand your knowledge of motors and transformer operations by teaching you how to determine correct motor and transformer connections, and how to specify and apply the proper motor or transformer to meet load requirements. Numerous classroom workshops will reinforce your learning and give you the confidence to apply the knowledge you gained from attending this course when you return to your job.

Learn practical methods for specifying, testing, and maintaining two of the most common power system components. In this course, you'll learn how to apply, specify, operate, maintain and engineer the installation of power transformers and electric motors and associated equipment in an industrial, commercial, institutional, or electric utility setting.

This course will have deep focus on 3 crucial topics: Become familiar with standard transformer factory tests and how to interpret their results, learn the basics of transformer oil chemistry and how to understand Dissolved Gas Analysis results, understand how to perform and interpret electrical and mechanical field tests on motors. The trainer uses animations, particularly on motors and rotating magnetic fields to clarify concepts. Photos will be used throughout the course (show specific types of motor failure.)

By learning both in a single short course, what is learned about one will reinforce knowledge regarding the other. Certain aspects may be easier to understand in the context of a motor, or vice versa. One difference between motors and transformers involves connections: motor stators are connected either delta or ungrounded wye, while transformers have more connection options. This is covered in the transformers section. This course assumes basic familiarity with transformers and motors, although in-depth knowledge is not necessary. The course moves from a basic level into more advanced topics. This course will fill in the "missing pieces."

MASTER the necessary knowledge and complexities of:

- Know the different types of transformer construction and which is appropriate for a given application.
- Understand the purpose of and how to interpret transformer standard factory tests.
- Know how to use oil testing data (dissolved gas analysis) to diagnose problems before they lead to failure.
- Be familiar with electrical and mechanical field testing procedures for motors.
- Understand the effects of variable frequency drives on motors.
- Be able to formulate a sound strategy whether to repair or replace a damaged transformer or motor.
- Energy usage including comparison of high-efficiency to standard efficiency motors.

DURING THE 3 DAY SEMINAR THERE WILL BE 8 workshops involving calculations and design problems. Please bring a scientific calculator to the class. The 4 case studies explore actual applications that illustrate important points presented in the course.

Case Study 1 – Transformer Specifications
- Key elements of a transformer specification
- Loss evaluation strategy
- Bid evaluation

Case Study 2 – Transformer Loading
- Use of IEEE loading guides
- Effect of loading on asset health
- No-load and load losses

Case Study 3 – Autotransformer Starter
- Implementation of reduced voltage starter on 45,000 HP synchronous motor
- Impact of starter on reliability
- Safety precautions while starting motor

Case Study 4 – Motor Replacement
- Failure modes of induction motors
- Effect of variable-frequency drives on motor health
- Necessity to review nameplate data when replacing a motor

This program is intended for:

Utility, plant, or consulting engineers and technicians involved in the selection, specification, application, operation, testing maintenance, installation, or engineering of the installation of motors or transformers.

- Electrical Engineer/ Electrical Services Manager
- Field engineer
- Production Engineer
- Distribution Engineer
- Maintenance engineer / Supervisor
- Manager of Operations
- Manufacturing engineer
- Senior Engineer / Staff Engineer
- Design Engineer - involved in design of systems involving motors and transformers.
- Testing and Maintenance Manager
- Engineers who want to know how to determine correct motor and transformer connections, and how to specify and apply the proper motor or transformer to meet load requirements.
- Experienced engineers who want to fills in gaps in their knowledge, making transformers and motors more understandable.

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DAY 1

Transformer Background

- Review of basic theory
- General types
- Internal components
- Accessories
- Construction
- Energy Efficiency
- Loss Specification

Factory Test

- Bushing power factor and capacitance
- Insulation power factor and insulation resistance
- Core megger
- Sweep Frequency Response Analysis (SFRA)
- Leakage reactance (single and three phase)
- Transformer Turns Ratio (TTR)
- DC Winding Resistance
- CT testing before oil fill - ratio, polarity, continuity
- Transformer 10kV excitation, single (1) and three (3) phase

Transformer Test Report

- Analysis and interpretation

Workshop – Understanding Report Data

DAY 2

Transformer Oil Analysis

- Basic chemistry
- DGA (Dissolved Gas Analysis)
- Duval triangles
- Continuous monitoring
- Case studies

Workshop – Applying Duval triangles

Induction Motors

- Review of basic theory
- General types
- Construction
- Inverter-duty designs
- Energy efficiency

DAY 3

Field tests

- Winding resistance
- No-load running current and power
- High-potential (hipot) test
- Locked-rotor test
- Air-gap measurement
- Phase sequencing / rotor rotation
- Current balance
- Insulation resistance
- Bearing temperature rise
- Shaft voltages
- Audible noise
- Vibration / Alignment / Balancing

Workshop - Interpreting field test results

Repair versus replace

- Use of Condition-Based Maintenance (CBM)
- Age, general condition, uniqueness
- Lead times
- Spare units
- Efficiency improvement

Conclusion

ENERGY1
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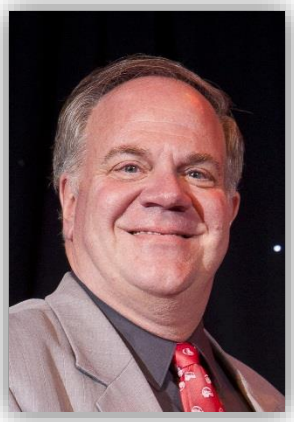
Energy1 is a sub-division of PETRO1 focus on provide trainings & technical Consultancy services. We help decision makers apply high level technical expertise to their daily task and strategic issues across a host of industries and disciplines including energy, manufacturing , maritime, defense, Aviation, Water treatment and chemicals. With this, we had successfully made impact to Energy professional mainly the Top 50 Energy players in the Asia Pacific Region

- Metropolian Waterworks Authority Thailand.
- Tenaga nasional berhad.
- San Fernando Electric Light & Power co, Inc
- Sarawak Energy
- SP Powergrid ltd.
- Power Seraya
- SMT Technologies
- Star Energy Geothermal
- Perbadanan bekalan air pulau pinang
- Aliran ihsan resources berhad
- Visayan Electrical company
- Glow Company
- Suruhanjaya Tenaga
- Indah Water Konsortium
- Jimah 0&M
- Renesas Semiconductor
- Sandisk Storage
- Muehlbauer
- Dominant OPTO Technologies
- Finisar Malaysia
- Sanmina System
- Bose System
- Amkor Technology
- EDMI Electronics
- AUO SUNPOWER

Advanced Electric Motors and Power Transformers (3 Days)

Programe Facilitator – Ralph Fehr, Ph.D., P.E.



Ralph's expertise

- 30 years of electric power engineering experience with 15 years of training experience in Southeast Asia.
- Transmission, Distribution, and Substation Planning – 500 kV, 230 kV, 138 kV, 115 kV, 69 kV, 46 kV, feeder planning and design.
- System Operations – operating studies, dispatcher training.
- Transmission Line Engineering – line routing, structure design, and design automation.
- Power Generation Engineering – Fossil and Nuclear – cable systems, voltage drop and short circuit calculations, annunciator design, balanced draft conversions

Ralph E. Fehr, PhD, PE, is an independent engineering consultant and instructor in power system engineering at the University of South Florida. He has more than 30 years of experience in the electric power industry and is a registered engineer in Florida and New Mexico. Fehr has held various positions in transmission and distribution engineering design, operations, planning, and maintenance at Tampa Electric Company, Florida Power Corporation, Public Service Company of New Mexico, the U.S. Air Force, and Gilbert/Commonwealth Engineers and Consultants.

He is an experienced instructor of university engineering courses and continuing education short courses. Fehr has written technical articles for EC&M magazine and is author of the textbook, Industrial Power Distribution. Fehr received a bachelor's degree in electrical engineering from the Pennsylvania State University, a master's degree in electrical power engineering from the University of Colorado at Boulder, and a Ph. D in electrical engineering from the University of South Florida.

Ralph's achievements and recognitions

Doctor of Philosophy – Electrical Engineering – University of South Florida at Tampa (2005)
Master of Engineering – Electrical Engineering (Power) – University of Colorado at Boulder (1987)
Bachelor of Science – Electrical Engineering – Pennsylvania State University (1983)

Institute of Electrical and Electronics Engineers (IEEE)

- Senior Member (1999), Member (1984), Student Member (1983)
- Power & Energy Society and Industry Applications Society member

IEEE Florida West Coast Section Engineer of the Year (2015)
IEEE Florida West Coast Section Power & Energy Society Outstanding Engineer (2014)
IEEE Region 3 Joseph M. Biedenbach Outstanding Engineering Educator (2011)
IEEE Florida Council Outstanding Engineering Educator (2009)
Transmission & Distribution World magazine Instructor of the Month (November 2008)

Authored Industrial Power Distribution (2nd Ed. – Wiley/IEEE Press, 2016; 1st Ed. – Pearson/Prentice Hall, 2002)
Dissertation: An Integrated Optimal Design Method for Utility Power Distribution Systems (2005)
Published papers: U.S., Thai Utilities Partner to Address Asset Health (2014)
Assessing & Improving Writing in the Engineering Curriculum (IJEE, 2008)
A Model Curriculum for Power Engineering (IEEE PES, 2008)
A High-Performance Distribution Substation Bus Topology (IASTED, 2004)
Magazine articles: Harmonics Made Simple – EC&M Magazine – January 2004
The Trouble with Capacitors – EC&M Magazine – December 2003 and January 2004
Back to Basics (monthly column) – EC&M Magazine – January - December 2003

Companies which have benefited from his expertise include:

Alliant Energy, American Superconductor, American Transmission Company, BP America, Inc., Conoco Phillips, Duke Energy, Eaton Corporation, Electricity Generating Authority of Thailand, Emerson Network Power, Hawaiian Electric Company, Idaho National Laboratory, John Deere and Company, Kenya Power and Lighting Company, Schlumberger, Schneider Electric, Southern California Edison, Taiwan Power Company, Tampa Electric Company, Tokyo Electric Company, Trane, Korea Electro-technology Research Institute, Lawrence Livermore National Laboratory, Metropolitan Electricity Authority of Thailand, Pacific Gas and Electric, Praxair, Proctor & Gamble, Provincial Electricity Authority of Thailand, Public Service Electric & Gas, Rochester Gas & Electric, S&C Electric Company, Salt River Project, Saudi Aramco, Saudi Electricity Company, U.S. Air Force, U.S. Army Corps. Of Engineers, U.S. Coast Guard, U.S. Federal Aviation Authority, U.S. Navy, U.S. Nuclear Regulatory Commission and Xcel Energy.

Advanced Electric Motors and Power Transformers
Registration Form

Advanced Electric Motors and Power Transformer	Early Bird Full 3 Days	Standard Price Full 3 Days
Per Delegate	SGD 2437 ( )	SGD 2967 ( )
3 or more	SGD 2119 ( )	

- Please note that all registrations must be made at the same time to qualify.
- Early Bird Promotion Deadline – 12th June 2017
- The above price is inclusive of 6% GST.

PROGRAM DETAILS
Venue: Kuala Lumpur
Date: 10th – 12th July 2017

REGISTER NOW
CONTACT: kelvin
MAIN: +603 7727 3952
FAX: +603 7727 5278
Email: registration@petro1.com.my

( ) I would like to organize this training on-site and save at least 25% on the total course Fees! Please call +603 7727 3952 for more about our in-house training or email iht@petro1.com.my (Terms & Conditions apply)

Delegate Details

1. Name:_____Mr☐Mrs☐Ms☐Dr☐

Job Title: _____

Email : _____

Contact No: _____

Department:_____

2.Name:_____Mr☐Mrs☐Ms☐Dr☐

Job Title: _____

Email : _____

Contact No: _____

Department:_____

3.Name:_____Mr☐Mrs☐Ms☐Dr☐

Job Title: _____

Email : _____

Contact No: _____

Department:_____

Head of Department:_____

Invoice Details

Invoice Attention to:_____

Company:_____

Industry:_____

Address:_____

Postcode:_____ Country:_____

Telephone:_____ Fax:_____

Email:_____

Authorized Signature : _____

Credit card Payment

Please Debit my credit card:

☐ VISA ☐ MASTERCARD

Card Number: _____ - _____ - _____ - _____

Security Code: ☐☐☐ Expiry Date: ☐☐☐☐

Named printed on card:_____

Signature:_____

Payment Method
By Direct Transfer: Please quote invoice numbers on remittance advice.

GST input Tax claim
Organization who have register under GST is allow to claim on any GST Incurred (Known as input tax) on their purchase to the business.

ACCOUNT NAME : **PETRO1 SDN BHD**
BANK : **United Overseas Bank (Malaysia) BHD**
ACCOUNT NO : **202 – 900 – 319 -1 (SGD)**
SWIFT CODE : **UOVBMYKL**
All bank charges to be borne by payers. Please ensure that PETRO1 SDN BHD received the full invoice amount.
*** Credit card payment will include a charges 2.8%**

Payment Policy: Upon receipt of a completed registration form, it confirms that the organization is registering for the seat(s) of the participant(s) to attend the conference or training workshop. Payment is required with registration and must be received prior to the event to guarantee the seat. Payment has to be received 7 working days prior to the event date to confirm registration.

Venue: All of our training courses are held in 4 – 5 star venues.
The course fee does not include accommodation or travel cost. It's recommended to book the hotel room early as there are only limited room available at the discounted corporate rate.

DATA PROTECTION
The information you provide will be safeguarded by Petro1 that may be used to keep you informed of relevant products and services. We take it seriously when it come s to protection of our client data.

Cancellation & Substitutions: Upon receipt of a completed registration form, it confirms that the organization is registering for the seat(s) of the participant(s) to attend the conference or training workshop. Should you be unable to attend, substitutes are always welcome at no additional cost. Please inform us as early as possible. Payment is non-refundable if cancellation occurs 7 working days prior to event commencement. However a substitute is welcome at no additional charges. If cancellation occurs 5 working days prior to the registration date and there is no substitute, the organizer reserves the right to charge 50% of the total investment from your organization.

PETRO1 SDN BHD is not responsible for any loss or damage as a result of a substitution, alteration or cancellation/postponement of an event. PETRO1 SDN BHD shall assume no liability whatsoever in the event this training course is cancelled, rescheduled or postponed due to a fortuitous event, Act of God, war, fire, labor strike, extreme weather or other emergency.

Walk in Registration: Walk-in participants with payment will only be admitted on the basis of seat availability at the event and with immediate full payment.

Program Change policy: The organizer reserves the right to make any amendments and/or changes to the workshop, venue, facilitator replacements and/or modules if warranted by circumstances beyond its control.