



FROM YOUR PARTNER IN ENERGY EDUCATION

BEST GLOBAL PRACTICES

2nd Excitation and Control Systems for Power Generation



EXPERT TRAINER
DOUGLAS COPE

November 6 to 7, 2017 | The Lighthouse, Lopez Building
Meralco Compound, Ortigas Center, Brgy. Ugong, Pasig City, Philippines

2nd Excitation and Control Systems for Power Generation

ABOUT THIS TRAINING COURSE

The two day course is designed for electrical engineers and operational staff involved in power generation. The content is relevant for all types of generation involving synchronous machines; from traditional coal, oil, gas and hydro, to offshore and nuclear. The course will give delegates a firm understanding in the operation of excitation control systems along with an appreciation of the different types available and the numerous systems offered by the major manufacturers.

LEARNING OUTCOMES

Delegates will learn about:

- Fundamentals of the synchronous machine
- The generator capability diagram
- Excitation system components
- Excitation system control theory
- Parallel operation of generators
- Brushless / Rotating excitation systems
- Static excitation systems
- Power System Stabilisers
- Transmission company compliance
- IEEE Excitation Standards

WHO SHOULD ATTEND

- Electrical engineers involved in power generation both onshore and offshore
- Power plant operational staff



EXPERT COURSE TRAINER DOUGLAS COPE

Douglas has been working in the EC&I field for 23 years in a variety of industries; the last 13 of those in power generation. He has worked as a senior design engineer for Alstom Electrical Machines where he designed and commissioned excitation control systems for coal, oil, nuclear, gas and hydro generation plants from 1MW to 1,200MW worldwide. The last two years of his time at Alstom were spent as Engineering Manager for the excitation controls division.

He subsequently moved to RWE nPower as their Lead Excitation Engineer, responsible for the excitation systems of RWE's entire UK fleet plus numerous third party utility companies.

In 2011 he set up an independent excitation system consultancy company and now provides consultancy services and training to most of the major UK utility companies, plus companies in Europe, Asia and the US.

WHAT FORMER PARTICIPANTS SAY ABOUT THIS COURSE

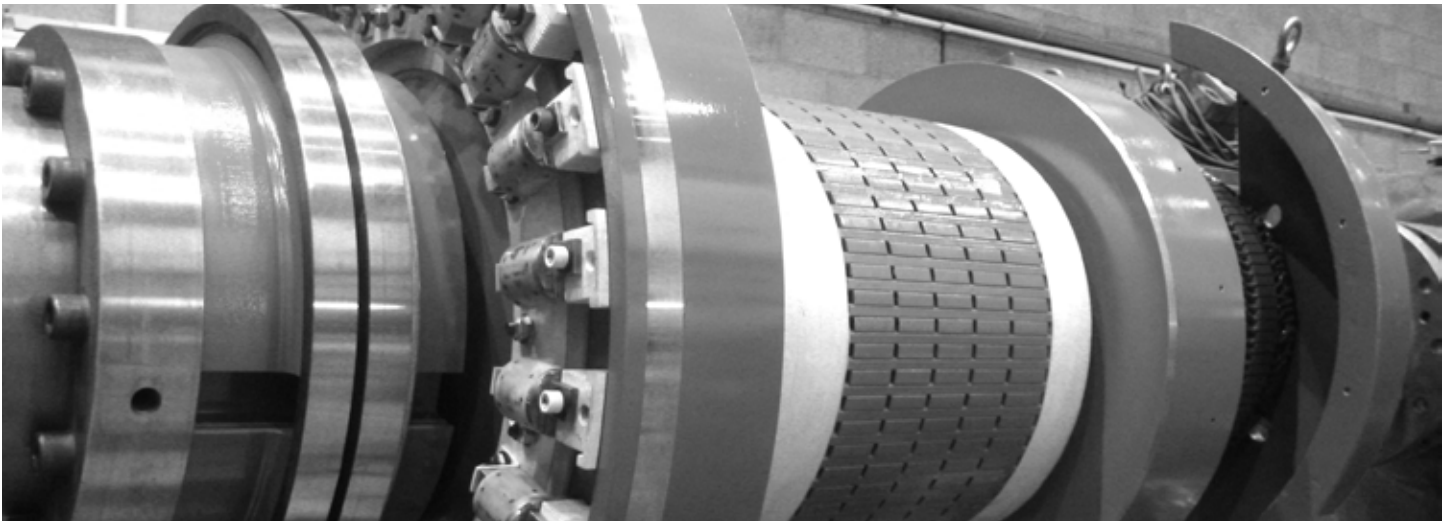
"Excellent course on Excitation Systems.
Highly recommended"
S.Manager, TNB REMACO

"A very useful course and well organised"
Head of Electrical Engineering
Shell Refining Company

"This course very helpful and useful for those whose work related with power generation to get more understanding on excitation systems to troubleshoot and maintenance"
Engineer, TNB



Meralco Power Academy (MPA) is a premier training and energy education provider that leverages on MERALCO's 114 years of industry experience, expertise and network. Its array of technical programs lend industry practitioners a competitive edge through top of the line learning solutions which are delivered in a variety of methods. MPA provides the learning platforms and coalitions for leaders, decision makers, managers and advocates by facilitating technical exchanges on global innovations and technologies on power and energy.



COURSE OUTLINE

2nd Excitation and Control Systems for Power Generation

DAY 1 COURSE INTRODUCTION

INTRODUCTION TO SYNCHRONOUS GENERATORS

Key Learning Points:

- What is a synchronous generator?
- Basic synchronous generator theory
- The component parts of a synchronous generator
- Synchronous generator examples

INTRODUCTION TO EXCITATION SYSTEMS

Key Learning Points:

- What is an excitation system?
- Basic excitation theory
- Why do we need one?
- Excitation system examples

BRUSHLESS / ROTATING EXCITATION SYSTEMS

Key Learning Points:

- What is brushless excitation?
- Brushless and rotating – what's the difference?
- Advantages and disadvantages
- Case studies

STATIC EXCITATION SYSTEMS

Key Learning Points:

- What is static excitation?
- Advantages and disadvantages
- Case studies
- The capability diagram (operating chart)

CAPABILITY DIAGRAMS

Key Learning Points:

- What does the capability diagram tell us?
- Different types of diagram
- The under excitation (MVar) limiter
- The over excitation limiter
- Case studies

DAY 2 EXCITATION SYSTEM COMPONENTS

Key Learning Points:

- The PMG / HFA
- The exciter
- The rectifier
- The static rectifier
- The excitation transformer
- AVR output stages
- Component examples

CLOSED LOOP CONTROL THEORY

Key Learning Points:

- Generator voltage control
- Field current control
- The transfer function diagram

PARALLEL OPERATION OF GENERATORS

Key Learning Points:

- Problems with parallel operation
- Droop (compounding) AVR control
- Reactive load sharing
- Power factor control
- MVar control
- Power System Stabilisers

COMMISSIONING, OPERATION AND MAINTENANCE

Key Learning Points:

- Excitation system commissioning
- What happens when it goes wrong
- Transmission company compliance
- Troubleshooting
- Preventative maintenance
- Excitation Performance evaluation

EXCITATION SYSTEM STANDARDS

Key Learning Points:

- IEEE Std 421.2 - Guide for Identification, Testing, and Evaluation of the Dynamic

Performance of Excitation Control Systems

- IEEE Std 421.5 - Recommended Practice for Excitation System Models

SEMINAR RATES

Includes course manual, lunch, snacks and program certificate.

EARLY BIRD RATE	REGULAR RATE	GROUP RATE
Register by October 15		for 3 or more delegates
PhP44,800 net	PhP50,400 net	PhP44,800 net
Per Participant	Per Participant	Per Participant
VAT inclusive	VAT inclusive	VAT inclusive

YES! I am interested in attending Meralco Power Academy's 2ND EXCITATION AND CONTROL SYSTEMS FOR POWER GENERATION Course!

I am sorry but I won't be able to attend. You may send me materials on your upcoming events.

PAYMENT METHODS AND TERMS

1. Payments may be deposited to:

Account Name: Meralco Power Foundation Inc.

BDO Savings Account No 4630-2297-12 (Meralco Branch)

Please email a copy of your deposit slip to astibayan@meralco.com.ph or power.academy@meralco.com.ph

2. We shall send you a confirmation of your enrollment upon receipt of the accomplished registration form.

3. Cancellations made 7 days before the program shall be non-refundable.

4. For any concerns, please contact Angie Tibayan at 1622-6758, mobile: 0999-881-3762, email: astibayan@meralco.com.ph

REGISTRATION FORM

COMPANY DETAILS

Company Name	<input type="text"/>
Company's TIN Number	<input type="text"/>
Office Address (Billing Address)	<input type="text"/>
Contact Person	<input type="text"/>
Email Address	<input type="text"/>
Contact Number	<input type="text"/>

PARTICIPANT'S DETAILS

Name	<input type="text"/>
Nickname (for the name tag)	<input type="text"/>
Designation	<input type="text"/>
Email Address	<input type="text"/>
Contact Number	<input type="text"/>
Dietary Restrictions	<input type="text"/>