

13th Successful Run in Asia!

EXCITATION SYSTEMS

Get 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.



15 – 16 MAY 2017, SINGAPORE

PAST TESTIMONIALS

“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

Expert Course Faculty Leader



Douglas Cope

Electrical Engineer at
Excitation and Engineering Services Ltd



EXCITATION SYSTEMS

15 – 16 MAY 2017, SINGAPORE

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

Your Expert Course Faculty

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.

This training course has a limited attendance for up to 20 participants only.

Sessions commence at 9am on all days, with short intervals at 10.30am and 3.30pm respectively.

Refreshments will be provided in the short intervals.

Lunch will be provided at 12:30pm for 1 hour. Sessions will end at 5pm on all days.

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2 Day Course Outline

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

OTHER AVAILABLE COURSES

- [4 Pillars of Transformer Condition](#)
- [Advanced Project Finance for Power](#)
- [Advanced Technical Report Writing & Presentation Skills](#)
- [Advanced Turnaround Shutdown & Outage Management](#)
- [Ancillary Services in Competitive Electricity](#)
- [Asset Management for the Power Industry](#)
- [Best Practice Renewable Energy Capital & Project Management](#)
- [Biomass Power Generation](#)
- [CFB Combustion for Boiler Operations](#)
- [Clean Development Mechanism and Carbon Markets](#)
- [Coal Contracts](#)
- [Combined Cycle Power Plants Operation](#)
- [Combined Heat & Power \(CHP\) and Co-Generation Plant Operations](#)
- [Competency Management System for the Power Industry](#)
- [Design & Operations of Circulating Fluidized Bed Boiler](#)
- [Developing & Structuring Public-Private Partnership \(PPP\) for Infrastructure](#)
- [Effective Tender Process Management for Power & Utilities](#)
- [Electrical Hazop \(eHazop\) Studies for the Power Industry](#)
- [Electricity Demand-Side Management](#)
- [Electricity Industry Design](#)
- [Electricity Network Planning](#)
- [Electricity Retail Contracts](#)
- [Electricity Theft](#)
- [Electricity Trading Essentials](#)
- [Energy Efficiency](#)
- [EPC Contract Management for Power & Utilities](#)
- [Essentials of Coal Markets and Trading](#)
- [Essentials of Power Trading](#)
- [Excitation Systems](#)
- [Feed-In Tariffs for PV Systems](#)
- [Finance for Non-Finance Professionals in Power & Utilities](#)
- [Financial Modelling for Project Finance in Power & Utilities](#)
- [Fitness-For-Service AP1 579 & High Energy Piping Life Management](#)
- [Fundamentals of Geothermal Energy](#)
- [Fundamentals of Power Generation](#)
- [Gas & LNG Contract Negotiation](#)
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- [Gas Turbine Hot Gas Paths, Rotors & Failure Analysis](#)
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- [GE Gas Turbine Operations Simulation Based](#)
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- [HV Substation Design & Construction](#)
- [IEC for Utilities](#)
- [Integration of Distributed Generation](#)
- [Introduction to Carbon Capture & Storage](#)
- [Introduction to Clean Coal Technology](#)
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- [Keeping Electrical Switchgear Safe](#)
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- [Medium Voltage & High Voltage Switchgear Metallurgy for Engineers](#)
- [Mechanical Engineering for Non-Mechanical Engineers](#)
- [Mini Hydro Project Analysis](#)
- [MKV Speedtronic Control System](#)
- [MK VI Speedtronic Control System](#)
- [Nuclear Energy Project Planning & Economics](#)
- [Nuclear Power](#)
- [Offshore Platforms Electrical Systems Design & Illustrations](#)
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- [Uninterruptible Power Supply](#)
- [Vibration Analysis & Condition Monitoring](#)
- [Waste to Energy Plant Operations](#)
- [Water Treatment and Corrosion Control for Steam Generation and Power Production](#)
- [Writing Effective Standard Operating Procedures \(SOP\) for Power & Utilities Professionals & Engineers](#)

Frequently Asked Questions (FAQs)

1. Does PowerEdge have other programmes than those listed?

We have more than 200 programmes that we are capable of running. All we need is for you to contact us and request for the preferred programme and we will be able to develop it.

2. Where is PowerEdge based?

PowerEDGE is headquartered in Singapore but we run our training programmes in different venues around Asia.

3. What does PowerEdge do?

We are a Power & Utilities Training Specialist.

4. Can this course be done in our city?

It absolutely can. Get in touch with us to request for a training programme to be carried out in your city.

5. Can you reduce the price of our preferred course?

While our price has been reduced before it is even launched, we are always happy to help you with further discounts.

6. Can you change the dates of the course?

If you have a special requested date, let us know and we will arrange another session for you.

7. Who are the companies that will be participating?

This varies from a diversity of Power Operators, Regulators, Financiers, to Vendors in the Power & Utilities industry.

8. Where is the venue for the course?

We usually engage a 4 to 5 star hotel meeting room to ensure the comfort of our participants.

9. How many delegates should we expect for each course?

This varies from 15 to 20 participants. Class sizes are kept small to allow trainers to focus better on each participant.

10. What are the different payment modes?

We accept Visa/MasterCard, cheques, bank transfers and cash on site.

11. Is accommodation included when I sign up for a course?

Accommodation is not included in the course fee but we are always happy to advise on available accommodations.

12. Can I get a cheaper accommodation through PowerEdge?

We will be pleased to help you negotiate a better rate with hotels.

13. Is lunch provided during the course?

We provide lunch and 2 tea breaks every day during our training programmes.

14. Are the training materials included once I have signed up for a course?

Yes, training and course materials are included in the course fee.

15. Will there be a certificate for the course?

Yes, there will be a certificate of participation upon completion of a course.

16. Who are PowerEdge trainers?

They are expert consultants and practitioners with many years of experience in the subject matter that they deliver on.

17. Are PowerEdge trainers competent?

We have received numerous favourable feedbacks on our trainers from past participants.

18. Can PowerEdge assist with Visa travel applications?

We can assist in advising you on the relevant procedure(s) and embassies/consulates that provide Visa for travel purposes.

19. Can we purchase training materials without attending a course?

Unfortunately this option is not available as training materials are specially developed for courses.

20. Can course content be tweaked to cater to our needs?

Of course! Just let us know your request and we will get the trainer to assist in carrying it out.

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15 – 16 MAY 2017, SINGAPORE

	NORMAL PRICE	2 PARTICIPANTS OR MORE	IN-HOUSE TRAINING
2 Day Programme	SGD 2, 500 Per Participant	SGD 2, 200 Per Participant	Guaranteed Minimum 40% Off Normal Price
	*SGD 2, 675 Per Participant (GST Inclusive)	*SGD 2, 354 Per Participant (GST Inclusive)	

*GST FOR SINGAPORE REGISTERED COMPANIES ONLY

ATTENDEE DETAILS

Name Job title

Tel Department Email

Name Job title

Tel Department Email

Name Job title

Tel Department Email

Name Job title

Tel Department Email

Name Job title

Tel Department Email

COMPANY DETAILS

Organisation name Industry.....

Address

Postcode..... Country.....

Tel Fax.....

PAYMENT METHODS

By Cheque/ Bank Draft: Make Payable to PowerEdge Pte Ltd.

By Telegraphic Transfer: Please quote AE1 with the remittance advise

Account Name: PowerEdge Pte. Ltd.

Bank Code: 7339 Branch code: 686 Account Number: 686-253386-001 Swift Code: OCBCSGSG

Bank Address: 65 Chulia Street OCBC Centre, Singapore 049513

All bank charges and payment in Singapore dollars (SGD) to be borne by payer. Please ensure that PowerEdge Pte Ltd receive the full invoiced amount.

PAYMENT POLICY

Payment is due in full at the time of registration. Full payment is mandatory for event attendance. I agree to PowerEdge Pte Ltd. payment terms

* GST- Exclusive price is only applicable for overseas corporate customers subject to qualifying conditions.

CANCELLATIONS & SUBSTITUTIONS

You may substitute delegates at any time. POWEREDGE PTE LTD does not provide refunds for cancellations. For cancellations received in writing more than seven (7) days prior to the training course you will receive a 100% credit to be used at another POWEREDGE PTE LTD training course for up to one year from the date of issuance. For cancellations received seven (7) days or less prior to an event (including day 7), no credits will be issued. In the event that POWEREDGE PTE LTD cancels an event, delegate payments at the date of cancellation will be credited to a future POWEREDGE PTE LTD event. This credit will be available for up to one year from the date of issuance. In the event that POWEREDGE PTE LTD postpones an event, delegate payments at the postponement date will be credited towards the rescheduled date. If the delegate is unable to attend the rescheduled event, the delegate will receive a 100% credit

RELATED TRAINING

- ✓ [Keeping Electrical Switchgear Safe](#)
- ✓ [Introduction to Power Systems](#)
- ✓ [Excitation Systems](#)
- ✓ [Fundamentals of Power Generation](#)

ON SITE TRAINING

Can't make it for the Course?
We'll make the course come to you!!

Simply let us know your preferred time and dates and we will meet you at your schedule and venue.

With a host of highly trained experts, we will be happy to customize your programme with your needs 100% fulfilled.

Contact us today at

✉ info@poweredgeasia.com
☎ (65) 6741 9927

