5th Successful Run in Asia!

ANCILLARY SERVICES

Understand ancillary services and how the definitions and practical implementation of ancillary services depend on electricity industry characteristics and electricity market design

28 – 29 JUNE 2016, SINGAPORE

PAST TESTIMONIALS

"This is a critical course for those with emerging markets for ancillary services so they can start it with learnings from existing competitive markets"
- President & CEO | SN Aboitiz Power Group

"The course was insightful that will aid me to easily prepare the day ahead. Ancillary Services schedule defines which generating power plants to provide regulating, contingency & dispatchable reserves as well as reactive power support & blackstart service."
- Senior Engineer, National Grid Corporation of the Philippines

"The training provided me with a good knowledge about how other countries implement their Reserve Market
- Deputy General Counsel, National Grid Corporation of the Philippines

"Great presentation! Excellent discussions!"
- Legal Counsel, Vivant Corporation.

Expert Course Faculty Leader

Dr Hugh Outhred

Hugh has 30+ years' experience in energy markets in research, consulting & teaching

energy institute Approved Training Provider

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Member of SEAS Sustainable Energy Association of Singapore

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About This Training Course

This two-day course explores the vital role of ancillary services in competitive electricity industries. The course will define ancillary services and discuss how the definitions and practical implementation of ancillary services depend on electricity industry characteristics and electricity market design. It will present case studies on ancillary service design and implementation in the UK, North America and Australia and discuss recent developments with respect to the deployment of smart grid concepts and growing levels of renewable energy penetration and demand-side participation.

Learning Outcomes

- Definitions of ancillary services used in competitive electricity industries and how those definitions depend on electricity industry characteristics and electricity market design.
- Practical implementation of ancillary services, with respect to technical characteristics and commercial arrangements for ancillary service provision.
- The role of technical standards and grid connection codes in ensuring the provision of frequency control and network management ancillary services.
- How the deployment of smart grid concepts and growing levels of renewable energy penetration and demand-side participation are affecting ancillary services.
- Approaches taken to the provision of ancillary services in the UK, North America and Australia.

Who Should Attend

The course is designed for professionals from the electricity industry, regulatory bodies, government, consultants and major energy users. Participants should have some technical knowledge of the electricity industry.

Your Expert Faculty: Dr. Hugh Outhred

In a 35-year research career, Hugh Outhred (PhD) has contributed to electric power system analysis and control, the theory of electricity industry restructuring and electricity market design, renewable energy technology, renewable energy integration, energy sector policy and sustainability policy. He has taught nearly 100 short courses on electricity industry restructuring and sustainability in a range of countries since 1988.

In 1993 and 1994 he co-authored a report on electricity industry restructuring for the California Energy Commission that highlighted the complexity of electricity restructuring in that context.

In 1995 and 1996 he led a project for the Australian National Grid Management Council to undertake electricity-trading experiments according to the proposed National Electricity Market trading rules prior to their formal implementation.

From 2004 to 2007, he was the founding Presiding Director of the Centre for Energy and Environmental Markets at the University of New South Wales. From 2009 to 2011, he was a Lead Author for the International Panel on Climate Change (IPCC) Special Report on Renewable Energy Sources and Climate Change Mitigation, published in 2011.

Hugh has been a Fulbright Senior Fellow at the University of California Berkeley

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

Ancillary services – role, definitions and provision
Discusses the role of ancillary services in maintaining safe, secure and reliable electricity industry operation. Defines the various categories of ancillary services (sub-divided into continuous and contingency services and grouped as those related to supply/demand balance (frequency control), those related to network management (voltage, waveform and network flow control) and those related to system restart. Reviews the causes for ancillary services requirements and the generation, network & end-use technologies that can provide them.

AM Tea Break

Managing and regulating ancillary service provision
Discusses the ways in which ancillary service requirements can be set through policy settings and then acquired and operated through management processes. Discusses economic and technical regulatory tasks for ancillary services, including economically efficient acquisition and causer-pays cost allocation, and the auditing of ancillary service provision and pricing.

Lunch

Provision of ancillary services by technical codes and standards, connection requirements & markets
Discusses the role of technical codes and standards and grid connection requirements in the provision of ancillary services. Reviews the roles that ancillary service markets can play in delivering economic efficiency and facilitating innovation in the provision of ancillary services.

PM Tea Break

Effects of 'smart grid' concepts, renewable energy & demand response in ancillary service provision
Discusses the implications of high levels of wind and solar energy penetration and the roles that 'smart grid' and 'smart meter" concepts can play in encouraging greater participation by end-users in the provision of ancillary services.

Discussion

Case study: Ancillary services in the UK electricity industry
Reviews the characteristics of the UK electricity industry and discusses the approach taken to defining and providing ancillary services as well as outcomes to date.

AM Tea Break

Case study: Ancillary services in the North American electricity industry
Reviews the characteristics of the North American electricity industry and discusses the approach taken to defining and providing ancillary services as well as outcomes to date.

Lunch

Case study: Ancillary services in the Australian National Electricity Market
Reviews the characteristics of the Australian National Electricity Market and discusses the approach taken to defining and providing ancillary services as well as outcomes to date.

PM Tea Break

Lessons from the international experience on the provision of ancillary services
Discusses lessons that might be learned from the above international experience with the provision of ancillary services in competitive electricity industries. Reviews current trends and expectations with respect to increasing penetration of non-storable renewable energy forms (e.g. wind & solar) and increasing engagement of end-users through smart metering.

Discussion

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 API 579 & High Energy Piping Life Management
Fundamentals of Geothermal Energy
Fundamentals of Power Generation
Gas & LNG Contract Negotiation
Gas Turbine Generator Selection, Operation & Maintenance
Gas Turbine Hot Gas Paths, Rotors & Failure Analysis
Gas Turbine Major Inspection & Overhaul
GE Gas Turbine Operations Simulation Based
HRSG Design, Operations & Understanding, Controlling of HRSG Damage Mechanisms
HV Substation Design & Construction
IEC for Utilities
Integration of Distributed Generation
Introduction to Carbon Capture & Storage
Introduction to Clean Coal Technology
Introduction to Power Systems
Keeping Electrical Switchgear Safe
Leadership & Team Dynamics for Power & Utilities
LNG Fundamentals
LNG Markets & SPOT Trading
Maintenance Planning & Scheduling
Making IPP & Renewable Energy Projects Contract Frameworks Bankable
Managing Complex Projects for Power and Utilities Professionals
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
Operations of Coal Fired Power Plants
Power Generation Commissioning, Operations & Maintenance
Power Generation Operation, Protection & Excitation Control
Power Plant Chemistry for Chemist & Chemical Engineers
Power Purchase Agreements
Process Control Methods
Programmatic CDM
Project Management for Power and Utilities
Relay Protection in Power Systems
Reliability Centered Maintenance Masterclass
Reliability Engineering
Renewable Energy Development & Investment
Renewable Energy Integration
Risk Based Inspection
Risk Management in Power Markets
Root Cause Analysis
Rotating Equipment Maintenance & Reliability Excellence
SCADA & Power Systems
Smart Grid
Solar Energy & Photovoltaic Power
Spare Parts Optimisation
Supercritical and Ultra-Supercritical Coal-Fired Power Plant
Technical Report Writing & Presentation Skills for Power & Utilities Professionals
Ultra Low NOx Gas Turbine Combustion
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 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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	NORMAL PRICE	EARLY BIRD ENDS 26 Dec 2015	GROUP OF 3 or More
2 Day Programme	SGD 3,500 Per Participant	SGD 3,300 Per Participant	SGD 3,000 Per Participant
	*SGD 3,745 Per Participant (GST Inclusive)	*SGD 3,531 Per Participant (GST Inclusive)	*SGD 3,210 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

REGISTER

Online Web Registration
info@poweredgeasia.com
(65) 6741 9927
(65) 67478737

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.

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