COAL PROPERTIES & SAFETY TRAINING
An essential & comprehensive course on coal analysis, international standards, coal sampling, laboratory analysis, instrumental analytical techniques coal blending & related coal safety issues

27 – 28 FEBRUARY 2017, KUALA LUMPUR, MALAYSIA

TOPICS COVERED

Introduction to Coal as a fuel
Coal Analysis
International and National Standards
Coal Sampling and Sample Preparation
Standard laboratory analysis of coal
Instrumental analytical techniques
Coal Blending
Related Coal Safety Issues
NOTE FROM TRAINER

Each year, billions of tonnes of coal are traded in national and international markets for use in power generation, steel and cement production, plus several other sectors.

The price of coal not only reflects the quantity of coal but also reflects the relationship of one or more properties to the performance of the coal under operating conditions.
The properties of coal often form the basis of sale contracts - and the payment for the coal is based on the analytical results.

Coal is a very heterogeneous material containing various organic and inorganic (mineral) matter - and therefore exhibits a wide range of physical properties.

The analysis of coal is generally performed on the coal samples taken from the bulk material and not from the individual components. Given the complexity of coal, sampling protocols must provide material that is representative of the cargo being sampled.
To ensure that a representative sample is collected, correct sampling procedures and rules should be followed. Also, coal analyses should be sufficiently accurate so as to preclude negative scientific or economic consequences.

All coal analyses should follow standard procedures in order to obtain repeatable and reproducible results. This course reviews the various aspects of coal sampling and analysis. It provides descriptions of standard procedures for coal sampling, preparation and routine testing of coal specified in the international Standards.

The commonly used techniques for routine coal analysis and recent developments are also examined. Blending of imported and domestic coal is becoming of increasing importance.

Until recently, coal blending in power stations was mainly adopted to reduce the cost of generation and increase the use of indigenous or more readily available coal.
Lower-grade (higher ash) coal can be mixed with higher grade (imported) coal without deterioration in thermal performance of the boiler - thus reducing the cost of generation.

In some cases coal blending is used as a form of pollution control, such as the combination different coals to ensure compliance with sulphur emission limits.

Many methods of coal blending are used. Coals can be blended at the coal mine, at the preparation plant, trans-shipment point, or at the power station.
The method selected depends upon the site conditions, the level of blending required, the quantity to be stored and blended, the accuracy required, and the end use of the blended coal.

This course examines the different reasons and priorities for coal blending. These include the methods used in coal blending, from coal characterisation though to mixing and storage methods, including some case studies in challenging situations.

There are several related safety issues that plant operators should evaluate when handling and storing coal.

Self-heating and spontaneous combustion can be a significant problem in the global coal industry - not only due to the obvious safety hazards and the potential loss of valuable assets - but also with respect to the release of gaseous pollutants from coal fires.

Basic policy and risk assessment measures that plant operators should adopt are reviewed in this course.
Key stages in coal transport, handling and storage are separately examined – ranging from coal handleability problems, vessel-related issues, coal stockpiles, conveyor belts and coal silos.

Current best practice covering safety and plant operation is included.
Introduction

- Course Objectives
- Further Reading + key abbreviations

Introduction to Coal as a Fuel

- Basic theory of coal formation
- Coal Rank
- Coal Classification
- Principle Commercial Characteristics of coal
- Overview of Coal Resource Issues
- Overview of international markets for coal

Coal Analysis

- Introduction – importance of coal analysis for the coal sector

International and National Standards

- Including: ISO, ASTM, China, India, UK, South Africa, Australia

Coal Sampling and Sample Preparation

- Sampling – principles and schemes
- Methods of sampling
- Mechanical Sampling Systems
- Sample preparation
- Bias and error

Standard Laboratory Analysis of Coal

- Proximate analysis
- Ultimate analysis
- Calorific value
- Ash analysis
- Other types of analysis – including chlorine, mercury, coking properties, HGI

Instrumental Analytical Techniques

- X-ray spectroscopy
- Electron microscopy
- Atomic spectroscopy
- Mass spectroscopy
- Neutron activation analysis
- Online analysis systems
- Conclusions

Coal Blending

- Introduction
- Reasons for coal blending – including growth of international coal trade
- The chemistry of coal blending
- Blending techniques

- Blending experiences
- Use of computer models and expert systems in determining blend characteristics
- Conclusions

Related Coal Safety Issues

- Introduction to Risk Assessment
- Auditing of premises
- Fire safety
- Spontaneous combustion
- Introduction to key features of spontaneous combustion
- Emissions – sampling emissions and target pollutants
- International issues and approaches to handling coal cargoes and stockpile heating
- Coal Handleability – and handleability auditing
- Conveyor belt safety issues
- Coal Silos – design and safety issues

General Conclusions to course

Note that equipment and plant case studies will be included throughout the course to highlight current trends and recent developments.
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

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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.
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. 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 an event you will receive a 100% credit to be used towards the rescheduled date. If the delegate is unable to attend the rescheduled event, the delegate will receive a 100% credit to be used towards a future POWEREDGE PTE LTD event.

### PAYMENT POLICY

Payment is due in full at the time of registration. Full payment is mandatory for event attendance.

**By Telegraphic Transfer:** Please quote AE1 with the remittance advice

**Guaranteed Minimum 40% Off Normal Price**

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### 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.

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### COMPANY DETAILS

Organisation name ............................................................... Industry ..................................................

Address .............................................................................................................................

Postal Code ..........................................................................................................................

Country ..........................................................................................................................

Tel ........................................................................................................................................

Fax ........................................................................................................................................

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### ATTENDEE DETAILS

Name ............................................................................................................................. Job title ..........................................................

Tel ................................................................................................................................. Department ..................................................

Email ..................................................................................................................................

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### PER PARTICIPANT

<table>
<thead>
<tr>
<th>Programme</th>
<th>Per Participant</th>
<th>2 Participants or More</th>
<th>IN-HOUSE TRAINING</th>
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<td>2 Day</td>
<td>SGD 2,700</td>
<td>SGD 2,500</td>
<td>Guaranteed Minimum 40% Off Normal Price</td>
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**Guaranteed Minimum 40% Off Normal Price**

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