

OPERATIONS OF COAL FIRED POWER PLANTS

26 - 30 March 2012, Kuala Lumpur



Expert Course Faculty
Brian Matkin

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Course Overview

The aim of the course is to provide a fundamental understanding of the engineering principles associated with the design and operation of the major plant items and supporting systems incorporated in a fossil fuelled power plant. A basic technical knowledge is assumed, but the trainer will explain the basic concepts behind the operation of plant items, in addition to their detailed function. Presentation of the course will be through a combination of lectures, presentations and group activities.

Course Learning Outcome

At the end of the course participants will have gained a thorough understanding of the processes and operation of a fossil fuelled power plant. They will be able to:

- Explain the thermodynamic process of power generation
- Describe fuel handling and methods of firing
- Describe the steam raising process and the components and operation of boilers
- Understand the operation of large steam turbo-generators
- Explain the function of alternators, transformers, switchgear and instrumentation
- Describe start-up and shut down procedures of power generating units

Who Should Attend

The course is intended for existing operations staff, or those aspiring to an operational role, in a coal- or oil-fired power station. The course will also be useful to maintenance staff who require a fuller understanding of the processes of fossil fuelled power generation.

What past participants have said

- Course suitable for new entry person to power industry
- This overall good participation
- Overall good training
- The trainer is experienced, knowledgeable and helpful
- Interesting and educating
- A well-organised introductory course for new comers
- More operational, more professional
- Good trainer, good material, good food
- This training has enriched my knowledge on power station operations
- I've got a lot of new knowledge from the training

You may also be interested in

Design and Operations of Circulating Fluidized Bed (CFB) Boilers

25th to 27th April, Kuala Lumpur, Malaysia

A Circulating Fluidized Bed (CFB) is an evolving technology that is very efficient in generating low-cost electricity with low emissions and environmental impact. As this is a new technology, in-depth knowledge on this technology is not been wide spread. This 3 day course is intended to provide detailed understanding on the concept of fluidized beds, operation of circulating fluidized bed boilers, operational problems in boilers, co-firing options and the environmental impact of the CFB boilers. [DOWNLOAD BROCHURE HERE](#)

Course Outline

Thermodynamics and Steam theory

- Heat transfer - radiation, conduction, convection
- Sensible and latent heat
- Superheat and reheat
- Saturation temperature, dryness, evaporation, condensation
- Throttling effects
- Steam table exercises

Boilers

- Boiler design
- Air & Gas paths
- Ash & Dust removal
- Steam/water circuit
- Soot-blowing system
- Drum
- Superheaters, desuperheaters
- Boiler stop valves

Combustion and Methods of Firing

- Types of fuel used for boilers -- coal -- oil -- gas -- biomass
- Constituents of fuels
- Calorific Value
- Combustion - chemical reaction and products of combustion
- Oxygen/air requirements excess air
- Atmospheric pollutants – control - site limits - EA
- Problems with waste derived fuels
- Flue gas treatments
- Fuel storage and handling - fuel gas systems

Turbine Plant

- Construction, casing – rotor - blades - glands - bearings - couplings
- Barring gear
- Support & expansion arrangements
- Thrust balancing arrangements
- Turbine condition monitoring - expansion – vibration - eccentricity
- Steam admission & extraction arrangements
- Governor gear
- Steam drains
- Gland steam system
- Oil systems – lub oil - hydraulic oil - jacking oil

Condensers, Feed and CW systems

Condensers

- Key features of water cooled and air cooled condensers
- Condenser tube leaks, cleaning systems
- Vacuum Plant, Steam ejectors - liquid ring pumps

Feed System

- Feed heaters - deaerator – boiler feed pumps
- CW system

Direct & closed circuit systems

- Pumps - screens - valves
- Natural draught cooling tower -- hybrid cooling tower
- Purge -- make-up – dosing

Electrical Theory and Alternators

- Electrical theory
- Electromagnetic induction
- Generator components - rotor – stator- exciter - AVR - slip rings & brushes - brushless excitation - cooling
- Generation of AC current
- Inductive & capacitive circuits -- power factor
- Synchronising
- Generator capability chart
- Switch gear
- Transformers
- Protection (simple appreciation)

Instrumentation and Control

- Pressure level, flow and temperature
- Transducers and transmitters
- Principles of control
- Pneumatic, hydraulic, electrical actuators
- Direct digital control (DDC) and distributed control (DCS)
- Control strategies

Water Treatment and Chemical Control

- Water impurities
- Hardness, silica, pH, dissolved solids, dissolved oxygen
- Cation and anion resin exchange
- Corrosion, prevention, dosing

Operation of units and auxiliary systems

- Boiler and steam turbine operation
- Alternator operation
- Auxiliary plant
- Unit starts and testing
- Unit trip and 'black' start procedures
- Alarms and emergencies
- Optimisation and efficiency

OPERATIONS OF COAL FIRED POWER PLANTS

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Your Expert Faculty: BRIAN MATKIN



Brian has considerable experience with coal fired plant up to 350MW and all Auxiliary Power Station Plant. As a Shift Charge Engineer, besides being responsible for the safe and efficient operation of the Units he was responsible for training Unit Operators to become Technician Engineers. In this new role the staff became responsible for the Permit System, HV Switching & Emergency Procedures.

Brian's Industry career achievements:

Eon/Powergen TXu Drakelow Power Station Drakelow Power station was a coal fired Power Station operating 2 x 350 MW Assisted Circulation Boiler/Units and 1 x 350 MW Supercritical Pressure Once through Boiler/Unit

- During unit outage joined Mechanical Maintenance where he was responsible for the Condenser/Feed Range repairs & Budget.

Eastern Electricity Drakelow Power Station

- Responsible for the introduction of computer based refresher training for PF Codes of Practice including liaison with outside agencies.
- In charge of Operations staff rotas and training of operators on the supercritical unit.
- Being responsible for the mill ball budget, saved costs by utilising high chrome second hand mill balls rather than new cast steel ones.

CEGB Drakelow Power Station

- Responsible for investigation into the total compressed air supply to the station and the replacement of the reciprocating compressors with up to date screw type compressors along with associated oil separating and drying equipment.

After the closure of Drakelow Brian went on to become involved in providing Operations training at various locations including Operations simulator training on a 500MW unit simulator (Coal Fired). He was also a part of a team to develop operations training for Flue Gas De-Sulphurisation Plant (Limestone/Gypsum Process). In addition he has carried out auditing of Safety Rules and associated documentation.

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REGISTRATION FORM

	Early Bird Ends 1 Dec 2011	Normal	Savings
5 Day Programme	SGD \$3400	SGD \$3600	SGD \$200

4 ways to Register

- Online: www.poweredgeasia.com
- Email: info@poweredgeasia.com
- Phone: (65) 6747 0775
- Fax: (65) 67478737

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Organisation name Industry

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PAYMENT METHODS

By Cheque/ Bank Draft: Make Payable to Asia Edge Pte. Ltd.
 By Direct Transfer: Please quote AE1 with the remittance advise
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- ✓ Introduction To Clean Coal Technology
- ✓ [Circulating Fluidized Bed Boiler](#)
- ✓ LNG Fundamentals
- ✓ Fundamentals of Power Generation

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