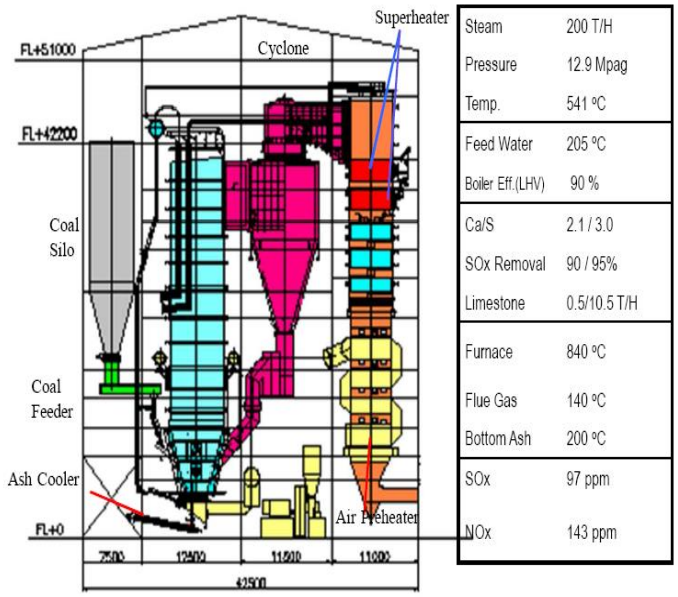
4th Successful Run in Asia!

CIRCULATING FLUIDISED BED COMBUSTION FOR BOILER OPERATORS

23 – 25 AUGUST 2017, KUALA LUMPUR, MALAYSIA



Steam	200 T/H
Pressure	12.9 Mpag
Temp.	541 °C
Feed Water	205 °C
Boiler Eff.(LHV)	90 %
Ca/S	2.1 / 3.0
SOx Removal	90 / 95%
Limestone	0.5/10.5 T/H
Furnace	840 °C
Flue Gas	140 °C
Bottom Ash	200 °C
SOx	97 ppm
NOx	143 ppm

TESTIMONIAL

"Overall, the training was a refresher and at the same time gave us wider view of the things that are important to look out for in our own plant. The presentation and references that we have acquired will become a major reference for all Petron personnel and will be relevant in the years to come. Chief Plant Engineer, Petron Corporation Philippines

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About This Training Course

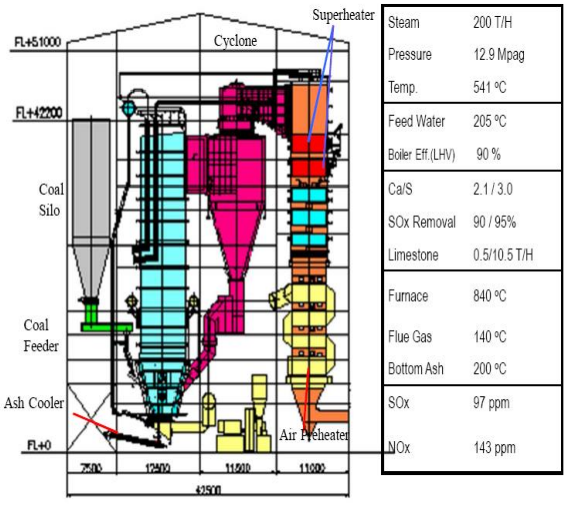
Circulating fluidised bed combustion (CFBC) is the predominant type of fluidised bed combustion technology used for power generation. The first development work on CFBC began in Germany in the mid-1970s. This was followed by commercialisation in Sweden, Finland and the USA. The first use of the CFBC technology for power generation started in 1985 with the operation of a 90 MWe CFBC boiler in Duisburg (Germany). Since then, over 600 coal-based CFBC generating units have been installed worldwide. A 2012 survey by Platts identified a total global capacity of more than 46 GWe – which continues to rapidly expand. Power plants using CFBC technology have been operating in the USA, Europe and Japan since the 1980s - and can now be found throughout the world [especially in China and a wide range of emerging economies].Today, CFBC technology can be considered as a mature technology for power generation/co-generation and industrial-sized applications and is commercially available from multiple suppliers.

Learning Outcomes – CFB COMBUSTION FOR BOILER OPERATORS

- The course commences with a detailed review of fluidisation processes.
- It then proceeds with a thorough examination of the key issues affecting the development and operation of CFBC plants – with case studies and operational experience being provided from a wide range of countries.
- It should be an excellent opportunity for CFBC plant engineers and other staff to discuss the various operational aspects of CFBC plants – particularly the key problems that plant operators regularly have to deal with.
- Remedies and solutions to key technical problems will be examined in detail during the course [with appropriate power plant case studies].

Who Should Attend

This course will be valuable to those who work in the power generation industry. The primary focus group of this training course is boiler operators and other technical professionals working within the power plant, who are looking to expand their understanding of combustion in general and CFB combustion in particular.



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4 Day Course Outline

Course Introduction

Introduction to Fluidisation

- Mechanisms of fluidisation
- Gas flow characteristics
- Bed particle dynamics
- Bubble dynamics
- Solids mixing
- Heat transfer issues

Introduction to Combustion and Pollutant Formation in FBC plants

Overview of Fluidised Bed Combustion systems

- Bubbling fluidised bed combustion
- Circulating fluidised bed combustion (CFBC)
- Atmospheric and Pressurised FBC technologies

Current Status of CFBC technologies

- Process Description
- Plant sizes
- Steam conditions
- Design variants
- Applications

Developments in CFBC technology

- Furnace design – dimensions and lower furnace designs
- Solid separator systems – cyclones, impact separators, optimised arrangement of solid separators
- External heat exchangers

Power Plant Operating Systems

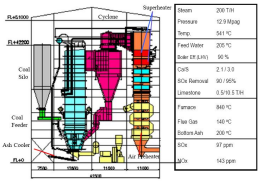
- Key systems available worldwide - and Cyber Security Issues

CFBC Case Studies

- Detailed case studies – highlighting the plant layout, range of fuels, and other operational information

Ash-related operational issues

- Slagging
- Agglomeration
- Erosion
- Ash cooling systems
- Strategies for dealing with operational issues – including detailed case studies



CFBC Ash Utilisation and Applications

- Challenges created by the ash composition of CFBC ash
- Leachability of ash
- Potential markets

Co-combustion issues in CFBC plants

Use of Petroleum Coke in CFBC plants

- Production of petroleum coke
- Types and properties of petroleum coke
- Petroleum coke-firing in CFBC plant
- Conclusions

Biomass fuel issues

- Fuel characteristics
- Co-firing biomass
- Technical and safety issues with biomass fuels

Other potential fuels

- Fuel characteristics and operational challenges

Advances in CFBC technologies and plants

- Scaling-up of CFBC
- Technical developments
- CFBC plants by region / country
- [Key features and fuel consumption of key CFBC plants are outlined]
- 600MWe+ designs
- Future developments – scale-up to 800MWe

Supercritical and Ultra-Supercritical Designs

- Overview of Supercritical technology issues
- Once-Through boiler technology
- Advanced materials
- Water Quality issues

CFBC Cogeneration Opportunities

Oxyfuel combustion

- Overview of the technology and its potential use in CFBC plants
- Review of demonstration projects

General conclusions from course

- Key points
- Developing a toolkit of knowledge and options for CFBC plant staff

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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	2 PARTICIPANTS OR MORE	IN HOUSE TRAINING
3 Day Programme	SGD 3,900 Per Participant	SGD 3,700 Per Participant	Guaranteed Minimum 40% Off Normal Price
	*SGD 4,173 Per Participant (GST INCLUSIVE)	*SGD 3.959 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.....

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

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