EUCI Presents a Course on:

COAL POWER PLANT FUNDAMENTALS

October 28-29, 2009 • Hyatt Regency Chicago • Chicago, IL

"This course was developed wonderfully! Great job starting with the simple examples (steam engine, simple DC generator) and building on that!"
Marie Moore, Exelon Corporation

"Really appreciated the discussion along the way of issues you can face with the various components. Thanks!"
Sherry Overbrook, Entergy Corporation

"Great course! We're all very busy and so I appreciated the quality and quantity of information presented in a two-day format."
Kevin Hopper, Associated Electric Co-op, Inc.

"Very good course! This course provided me with a sound overview of how coal is turned into energy. It was perfect for someone new to the energy industry."
David Bunch, Rio Tinto PLC

"Superb overview, from beginning to end of the coal power plant operations."
Chris Dorling, NESCO Group

"Desirable introductory course for someone new to the power generation industry."
Bob Zeiss, BASF Catalysts, LLC

This course has been approved for 16 CPEs.

EUCI is authorized by IACET to offer 1.4 CEUs for this program.

COAL POWER PLANT FUNDAMENTALS

October 28-29, 2009

OVERVIEW

This general introductory course provides some basic engineering concepts needed to understand how a coal-fired power plant works, followed by a general overview of power plant layout and operating principles. All major systems in the power plant will be discussed from coal handling to the switch yard. Relationships between power plant systems will be illustrated. **The focus will be on simple presentation of complex engineering ideas, so attendees are not required to have an engineering or scientific background to attend this seminar.**

WHO SHOULD ATTEND

- New employees who work at, or deal with, coal-fired power plants
- Generation dispatchers who need a basic understanding of coal-fired power plant operation
- Regulators, communications staff, and others who need a basic understanding of coal-fired power plant operations
- Administrative or management support professionals who need a better understanding of coal-fired power plants to plan and implement projects
- Corporate accountants who desire more information on coal-fired power plant operations and the factors that can affect operating costs
- Sales professionals who must have knowledge of coal-fired power plant operations to better serve customers

WHAT YOU WILL LEARN

- Identify how energy is released from fuel and how it is transformed into electrical energy by a power plant
- Discuss the basic principles of heat, work, and energy in the power cycle
- Review how the major equipment and sub-systems in a power plant work and how they work together
- Analyze how certain factors can affect the performance and availability of a power plant
- Review the basic operating principles of a power plant
- Discuss how electricity is directed out of the power plant

INSTRUCTOR

Philip J. O'Keefe
As a licensed Professional Engineer, inventor, teacher, scientist, manager, machinist, artist, scale model builder, and published author, Philip J. O'Keefe's professional accomplishments cover the gamut from a recognized expert within the electric utility industry to patent recipient within the medical device industry.

With over 27 years of engineering experience, Mr. O'Keefe provides expert witness services and litigation support in patent infringement, trade secret misappropriation, product liability, personal injury, regulatory compliance, and professional malpractice cases through his company, EngineeringExpert.net, LLC. His experience includes 14 years in the design, testing, and operation of fossil fuelled power plant systems. He is also a certified training instructor within the electric utility industry and has experience teaching courses on power plant operations, control systems, electrical safety, and efficiency testing.

IACET

EUCI has been approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 1760 Old meadow Road, Suite 500, mcLean, VA 22102. In obtaining this approval, EUCI has demonstrated that it complies with the ANSI/IACET Standards which are widely recognized as standards of good practice internationally.

As a result of their Authorized Provider membership status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standards.

EUCI is authorized by IACET to offer 1.4 CEUs for this program.

Requirements for Successful Completion of Program
Participants must sign in/out each day and be in attendance for the entirety of the course to be eligible for continuing education credit.

Instructional Methods
PowerPoint Presentations, Group Discussion

PROGRAM AGENDA

WEDNESDAY, OCTOBER 28, 2009

8:00 – 8:30 a.m. **Registration and Continental Breakfast**
8:30 a.m. – 5:00 p.m. **Course Timing**
12:00 – 1:00 p.m. **Group Luncheon**

8:30 - 8:45 a.m. **Introduction, Format, Objectives**

8:45 - 9:15 a.m. **Primer**

Power Plant Concepts
- A Simple Power Plant

Basic Energy Conversion
- Transferring Heat to Steam Energy
- Converting Steam Energy to Mechanical Energy
- Converting Mechanical Energy to Electrical Energy

9:15 - 10:15 a.m. **Heat and Energy**

Properties of Substances
- Mass, Volume, and Density

Pressure and Flow
- Units of Pressure
- Pressure Measurement
- Causes of Flow and Flow Measurement

Temperature and Heat

Forms of Energy
- Potential and Kinetic Energy
- Internal Energy
- P-V Energy

Importance of Temperature

Work and Heat in Power Plants

The Properties of Water
- Phases – Solid, Liquid, and Gas
- Change of Phase
- Specific Heat
- Effect of Pressure
- Density
- Properties of Steam

Improving the Basic Power Plant
- Containing Heat
- Fuel Delivery Systems
- Combustion Air
- Flue Gas Removal
- Steam Drum and Water Walls
- Superheater
- Reheater
- Steam Turbines
- Condensers
- Feedwater Heaters

10:15 - 10:30 a.m. **Morning Break**

CPE CREDITS

EUCI is registered with the National Association of State Boards of Accountancy (NASBA) as a sponsor of continuing professional education on the National Registry of CPE Sponsors. State boards of accountancy have final authority on the acceptance of individual courses for CPE credit. Complaints regarding registered sponsors may be addressed to the National Registry of CPE Sponsors, 150 Fourth Avenue North, Suite 700, Nashville, TN, 37219-2417.
Web site: www.nasba.org.

Upon successful completion of this event, program participants interested in receiving CPE credits will receive a certificate of completion.

This course has been approved for 16 CPEs. There is no prerequisite for this conference.
Program Level: Beginner
Delivery Method: Group-Live
Advanced Preparation: None

PROGRAM AGENDA

WEDNESDAY, OCTOBER 28, 2009 (CONTINUED)

10:30 - 11:30 a.m. **Combustion Basics**
How Does Fuel Burn?
Coal and Natural Gas Combustion
Heat Losses During Combustion
Fuel Preparation and Handling for Pulverized Coal and Cyclone Furnaces
Differences Between Coal, Natural Gas, and Oil-Fired Furnaces
Natural Gas, and Oil Ignition Systems
Hazards of Handling and Storing Fuels

11:30 a.m. - 12:00 p.m. **Handling of Combustion Air and Flue Gas**
Handling Combustion Air and Gas
- Types of Fans and their Applications
- Control of Fans
- The Combustion Air Path

Air Heaters and their Operation
The Flue Gas Path
- Furnace
- Economizer
- Scrubbers
- Precipitators
- Stack

12:00 - 1:00 p.m. **Group Luncheon**

1:00 - 1:30 p.m. **Combustion Heat Transfer**
Modes of Heat Transfer
Furnace Heat Transfer and Temperature Control
- Pulverized Fuel Firing
- Cyclone Firing

1:30 - 2:00 p.m. **Ash Removal**
- Nature of Ash
- Problems Caused by Ash Accumulation
- Boiler Designs for Slag and Ash Removal
- Equipment for Boiler Cleaning
- Fly Ash Removal systems
- Ash Conveyors
- Disposal

2:00 - 2:30 p.m. **Furnace Explosions**
- Causes, Combustion vs. Explosion
- Requirements for Proper Combustion
- Operating During Emergencies

2:30 - 2:45 p.m. **Afternoon Break**

2:45 - 3:15 p.m. **Boiler Steam-Water Cycle**

PROGRAM AGENDA

WEDNESDAY, OCTOBER 28, 2009 (CONTINUED)

Boiler Steam-Water Cycle
- Economizer
- Steam Drum/Downcomers
- Waterwalls
- Primary Superheater
- Secondary Superheater and Reheater

3:15 - 4:30 p.m. **Turbines**
Classifications
- A Typical Cycle
- Components
- Impulse and Reaction Turbines
- Steam Seals
- Lube Oil Systems

4:30 - 4:50 p.m. **Condenser**
- Types and Principles of Operation
- Cooling Water Systems
- Condenser Performance Factors
- Condenser Auxiliaries

4:50 - 5:00 p.m. **Summary**

THURSDAY, OCTOBER 29, 2009

7:30 – 8:00 a.m. **Continental Breakfast**
8:00 a.m. – 4:30 p.m. **Course Timing**
12:00 – 1:00 p.m. **Group Luncheon**

8:00 - 8:45 a.m. **Condensate and Feedwater Systems**
Flow Cycle
- Feedwater Heaters
- Low Pressure
- Deaerator, High Pressure
- Feedwater Heater Performance Factors
- Boiler Feed Pumps

8:45 - 9:15 a.m. **Water Treatment**
The Effects of Untreated Water on Operations
External Treatment
- Clarifying Filters and Demineralizers

Internal Treatment.

9:15 - 9:45 a.m. **Pumps and Compressors**
Centrifugal Pumps
- Theory of Operation and Principal Parts

Reciprocating and Centrifugal Air Compressors
- Theory of Operation and Principal Parts

PROGRAM AGENDA

THURSDAY, OCTOBER 29, 2009 (CONTINUED)

9:45 - 10:00 a.m. **Instrumentation**
- Pressure
- Temperature
- Flow
- Water Level
- Turbine Supervisory
- Combustion
- Water Analysis

10:00 - 10:15 a.m. **Morning Break**

10:15 - 10:45 a.m. **Main Control Systems and Interlocks**
Control
- Feedwater
- Combustion
- Temperature
- Turbine

Interlocks
- Boiler
- Turbine
- Electrical

10:45 - 11:15 a.m. **Plant Operations**
Basic Operating Procedures and Principles
Emergency Situations

11:15 a.m. - 12:00 p.m. **Station Performance**
Measuring Efficiency
Heat Rate
Factors Effecting Heat Rate

12:00 - 1:00 p.m. **Group Luncheon**

1:00 - 1:30 p.m. **Power Plant Electrical Primer**
Basic Electrical System Concepts
Simple Generation and Transmission Concepts

1:30 - 2:30 p.m. **Power Plant Alternating Current (AC) Generators**
Construction and Operating Principles of Large AC Generators
Exciter Systems

2:30 - 2:45 p.m. **Afternoon Break**

2:45 - 3:45 p.m. **Power Plant Switchyards**
Power Transformers
Buses
Bus Ducts
Disconnects
Circuit Breakers and Switchgear

3:45 - 4:30 p.m. **Review**
Summary of Material Covered
Final Questions and Discussion

PROCEEDINGS

The proceedings of the seminar will be published and one copy will be distributed to each registrant at the course.

COURSE LOCATION

A room block has been reserved at the Hyatt Regency Chicago, 151 East Wacker Drive, Chicago, Illinois, USA 60601, for the nights of October 27-28, 2009. Room rates are $199.00 single or $224.00 double, plus applicable tax. Call 312-565-1234 for reservations and mention the EUCI course to get the group rate. Make your reservations prior to September 28, 2009. There are a limited number of rooms available at the course rate. **Please make your reservations early.**

REGISTRATION INFORMATION

REMEMBER, EVERY 4TH REGISTRANT IS FREE
For instant registration, call (303) 770.8800 or fax the Registration Form to (303) 741.0849.

Register 3, Send 4th Free!!
Any organization wishing to send multiple attendees to these conferences may send 1 FREE for every 3 delegates registered. Please note that all registrations must be made at the same time to qualify.

All cancellations received on or before October 2, 2009 will be subject to a $195 processing fee. Written cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other EUCI conference or publication. This credit will be good for six months. In case of conference cancellation, Electric Utility Consultants' liability is limited to refund of the conference registration fee only. For more information regarding administrative policies such as complaint and refunds, please contact our offices at (303) 770.8800.

EUCI reserves the right to alter this program without prior notice.

MAIL DIRECTLY TO:
Electric Utility Consultants, Inc. (EUCI)
5555 Preserve Drive
Greenwood Village, CO 80121

FAX TO:
(303) 741.0849

PHONE:
(303) 770.8800

PLEASE REGISTER THE FOLLOWING

☐ Coal Power Plant Fundamentals, October 28-29, 2009, $1495
Early Bird Before October 16, 2009, $1295

ENERGIZE WEEKLY
When you sign up to "Energize Weekly" you will receive a new conference presentation each week via email on a relevant industry topic. The presentations are selected from a massive library of over 1000 current presentations that EUCI has gathered during its 22 years organizing conferences.

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How did you hear about this event?
(Direct email, Colleague, Speaker(s), etc.)

_____

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☐ Check here if you have any dietary or accessibility needs. We will contact you for more details.

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