COMBINED CYCLE POWER PLANT FUNDAMENTALS

March 17-18, 2020
Online | Pacific Time

RELATED EVENT:
HEAT RECOVERY STEAM GENERATOR (HRSG) FUNDAMENTALS
March 19, 2020 | Online

“"I highly recommend this course to get a good overview of all major components of a combined cycle power plant.”

Business Development Manager, ABB Inc.

In lieu of recent developments with COVID-19 we have, for the health and safety of our speakers and attendees, decided to move many of our events to Online Courses. This will enable you to view the courses from the comfort of your location while still benefitting from the depth of knowledge provided at our courses. The option is available on the registration page of all of our courses and hope you will be able to take advantage!
OVERVIEW

Based on new challenges in the fossil fuel industry, combined cycle technology is a leading solution in improving efficiency and reducing emissions. Many organizations have considered or are considering the placement and development of new combined cycle plants. This course will explain how these plants operate and what the advantages are of moving into the combined cycle arena. The basics of the chemistry of heat and energy will be shown in order for participants to understand how plants function. All major components of the plant will be discussed and reviewed, including turbines, generators, and emission-control systems. Complete operation and maintenance of the combined cycle system will be discussed. Participants will complete the course with an understanding of how plants function efficiently, from the introduction of fuel into the plant to the generation and transmission of electricity.

LEARNING OUTCOMES

• The basic concepts of energy conversion, namely conversion of chemical energy to electricity
• The basic concepts of temperature, work, and heat in power plant operation
• The basic components of a combined cycle power plant and how they work together to produce energy
• The basics of fuel combustion and how fuels are prepared and combusted in a combustion turbine
• The basic components of a heat recovery steam generator and how they work together to produce steam energy
• The basic components of a steam turbine and how the turbine transforms steam energy from the heat recovery steam generator into mechanical energy
• The basic components of the electrical generator and how the generator transforms mechanical energy from the turbine into electrical energy
• The basic components of an electrical switchyard and how it works to transmit electrical energy into the electrical transmission and distribution systems outside of the power plant
• Operation and maintenance of a combined cycle plant

WHO SHOULD ATTEND

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

“Excellent fundamentals course.”
Staff Accountant, Hermiston Generating Co. LP

“Good crash course in combined cycle engineering for non-engineers.”
US Legal Counsel, Capital Power Corp.
AGENDA

TUESDAY, MARCH 17, 2020

All Times are U.S. Pacific Time

8:00 – 8:30 am  Login and Welcome
8:30 am – 5:00 pm  Course Timing
12:00 – 1:00 pm  Lunch Break

Power Plant Primer
- Power plant concepts
- Examples of power plants
- Basic energy concepts
- Heat and energy
- Work and heat in power plants

Chemistry
- First law of thermodynamics
- Input = output at steady state
- Natural gas combustion
- Stoichiometry
- Excess air
- Heating value

Combined Cycle Plant Equipment
- Basic plant equipment
- Combustion turbine
- HRSG
- Steam turbine
- Cycle efficiency
- Equipment arrangement

Gas Turbines
- Types
- How they work
- Applications
- Components
- Flow paths

Heat Recovery Steam Generator
- Description and functions of a heat recovery steam generator (HRSG)
- Types and configurations of HRSGs
- How an HRSG produces steam
- Components of an HRSG
- Design considerations
- Fabrication considerations

“Very knowledgeable. Answered any questions asked and was very detailed on responses.”
Control Room Operator, Public Works Commission

“I found the Combined Cycle Power Plant Fundamentals course informative, interesting, and practical.”
Project Manager - Power, BHPB Iron Ore
AGENDA

TUESDAY, MARCH 17, 2020 (CONTINUED)

Steam Turbines
- Impulse and reaction turbines
- Turbine classifications, designations, and arrangements
- Technology advances
- Overview of steam turbine components
- Steam flow control
- Rotors
- Casings
- Bearings
- Blades
- Seals

Emissions Control
- Gas turbine emission pollutants
- Emissions control technologies and applications
- Dry low NOx burners
- Water injection
- Steam injection
- Frame and aeroderivative engines

WEDNESDAY, MARCH 18, 2020

8:00 am – 12:00 pm  Course Timing

Electrical Systems and Generators
- Example line diagrams
- VAR control
- Electrical equipment
- AC generators
- Switchgear
- Step-up transformers
- Emergency equipment

Balance of Plant Equipment
- Equipment in the cycle diagram
- Pumps
- Cooling systems
- Fuel supply
- Water supply
- Electrical supply
- Fire protection

"Excellent balance between elementary and advanced topics."
Service Sales Engineer, Elliott

"This course gives you a good basis of what equipment is included in a combined cycle plant and how it works."
B.D. Manager, Enerfab

"This was the class that I was looking for at my job. It provides a comprehensive overview for professionals like me."
Environmental Specialist, SMUD

REGISTER TODAY! CALL 303-770-8800 OR VISIT WWW.EUCI.COM
AGENDA

WEDNESDAY, MARCH 18, 2020 (CONTINUED)

Water Treatment, Instrumentation, and Controls
- Water treatment systems
- Instrumentation
- Main control systems and interlocks

Maintenance
- Gas turbine maintenance
- Steam turbine maintenance
- Generator maintenance

Operations
- Gas turbine operations
- Steam turbine operations
- Generator operations

Review

“Good high level overview of subject matter.”
Sr. Performance Monitoring Analyst, Salt River Project

INSTRUCTOR

Carl R. Bozzuto
Honorary Member, The Council of Industrial Boiler Owners

Carl Bozzuto has over 50 years of experience in combustion and boiler operations and research. He began his career as a research engineer, senior project engineer, manager, and director for Combustion Engineering Inc. Carl was named Vice President of Process Technology for the company, where he was responsible for the development and commercialization of new boiler and power plant technologies, including advanced cycles, ultra-supercritical boilers, alternative working fluids, fluid bed boilers, plant integration, and other plant component technology. Serving recently as Vice President of Technology for the Power Environment Sector at Alstom Power Inc., he was responsible for the development and implementation of new technology for boiler and environmental products on a worldwide basis. Bozzuto holds 18 U.S. patents and membership in the American Institute of Chemical Engineers (AIChE), the Combustion Institute, the Source Evaluation Society, and the American Society of Mechanical Engineers (ASME). He has authored more than 30 published technical papers and was Editor-in-Chief of the textbook Clean Combustion Technologies, published by Alstom Power in 2009. Bozzuto has earned Bachelor of Science and Master of Science degrees in chemical engineering from the Massachusetts Institute of Technology and a Master of Science degree in management from the Hartford Graduate Center (RPI).

“Carl was a very experience teacher with lots of knowledge.”
Combined Cycle Technician, Tri-State G&T
INSTRUCTIONAL METHODS

This program will use PowerPoint Presentations, group discussions as well as active participation.

REQUIREMENTS FOR SUCCESSFUL COMPLETION

You must be logged in for the entire presentation and send in the evaluation after the course is completed.

ONLINE COURSE DELIVERY & PARTICIPATION DETAILS

We will be using Microsoft Teams to facilitate your participation in the upcoming event. You do not need to have an existing Teams account in order to participate in the broadcast – the course will play in your browser and you will have the option of using a microphone to speak with the room and ask questions, or type any questions in via the chat window and our on-site representative will relay your question to the instructor.

• You will receive a meeting invitation which will include a link to join the meeting.
• Separate meeting invitations will be sent for the morning and afternoon sessions of the course.
  o You will need to join the appropriate meeting at the appropriate time.
• If you are using a microphone, please ensure that it is muted until such time as you need to ask a question.
• The remote meeting connection will be open approximately 30 minutes before the start of the course. We encourage you to connect as early as possible in case you experience any unforeseen problems.

IACET CREDITS

EUCI has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, EUCI has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Authorized Provider status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

EUCI is authorized by IACET to offer 1.1 CEUs for the course
Substitutions & Cancellations
Your registration may be transferred to a member of your organization up to 24 hours in advance of the event. Cancellations must be received on or before February 14, 2020 in order to be refunded and will be subject to a US $195.00 processing fee per registrant. No refunds will be made after this date. Cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other EUCI event. This credit will be good for six months from the cancellation date. In case of non-attendance, all registration fees will be forfeited. In case of course cancellation, EUCI’s liability is limited to refund of the event registration fee only. For more information regarding administrative policies, such as complaints and refunds, please contact our offices at 303-770-8800.

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

BOTH COMBINED CYCLE POWER PLANT FUNDAMENTALS AND HEAT RECOVERY STEAM GENERATOR (HRSG) FUNDAMENTALS COURSES: MARCH 17-19, 2020: US $2095
EARLY BIRD on or before FEBRUARY 28, 2020: US $1895

COMBINED CYCLE POWER PLANT FUNDAMENTALS COURSE ONLY: MARCH 17-18, 2020: US $1395
EARLY BIRD on or before FEBRUARY 28, 2020: US $1195

REGISTRATION INFORMATION
Mail Directly To:
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Greenwood Village, CO 80111
OR, scan and email to: conferences@euci.com

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p: 303-770-8800
f: 303-741-0849

PLEASE SELECT

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How did you hear about this event? (direct e-mail, colleague, speaker(s), etc.)

Print Name

Job Title

Company

Address

City

State/Province

Zip/Postal Code

Country

Phone

Email

CREDIT CARD INFORMATION

Name on Card

Billing Address

Account Number

Billing City

Exp. Date

Billing State

Security Code (last 3 digits on the back of Visa and MC or 4 digits on front of AmEx)

Billing Zip Code/Postal Code

OR Enclosed is a check for $ to cover registrations.

Substitutions & Cancellations
Energize Weekly is EUCI’s free weekly newsletter, delivered to your inbox every Wednesday. We provide you with the latest industry news as well as in-depth analysis from our own team of experts. Subscribers also receive free downloadable presentations from our past events.

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