HEAT RECOVERY STEAM GENERATOR (HRSG) FUNDAMENTALS

October 17, 2018
Hilton Garden Inn Arlington/Courthouse Plaza
Arlington, VA

RELATED EVENTS:
COMBINED CYCLE POWER PLANT FUNDAMENTALS
October 15-16, 2018 | Arlington, VA

SAFETY CONSIDERATIONS IN COMBINED CYCLE PLANTS
October 18, 2018 | Arlington, VA

“The EUCI offered HRSG course was extremely helpful, covered all the components related to HRSG.”
Senior Engineer, Duke Energy

EUCI is authorized by IACET to offer 0.7 CEUs for the course
OVERVIEW

This course on HRSG Fundamentals is intended for those that want to know a little bit more about the HRSG and its use in combined cycle and cogeneration plants. Topics to be covered include types of HRSGs, heat exchangers, boiler circulation systems, components, heat management, controls, water chemistry, emission controls, associated equipment, and fabrication/construction. Key features include heat transfer, surface arrangements, design/operating considerations, and integration with combined cycles and cogeneration equipment. Steam conditions will also be discussed.

LEARNING OUTCOMES

- Explain heat transfer and flow within HRSG
- Describe the function of the economizer, evaporator, superheater, reheater, and steam drum components
- Discuss saturated and superheated steam fundamentals, temperature and superheater controls
- Identify purpose of drains, vents, and safety valves
- Outline HRSG controls and protective trips
- Review HRSG construction

WHO SHOULD ATTEND

- New employees who work at or deal with heat recovery steam generators
- Engineering Staff
- Project Management
- Administrative staff who need a better understanding of HRSGs

“I am new to the industry and I found this course to be a perfect introductory course.”

Technical Sales, Groome Industrial

“The perfect course for beginners looking to learn the basics on HRSG.”

Civil Engineer, Intertechne
AGENDA

WEDNESDAY, OCTOBER 17, 2018

8:00 – 8:30 am  Registration and Continental Breakfast

12:00 pm – 1:00 pm  Group Luncheon

8:30 am – 5:00 pm  Course Timing

What is an HRSG?
- Recovers Heat Energy from Another Stream or Process
- Waste Heat Boiler
- Examples
- Electric Generation vs. Cogeneration

Heat Exchangers
- Basic Flows
- Heat Transfer
- Types of Heat Exchangers
- Key Parameters

Types of HRSG’s
- Horizontal
- Vertical
- Supports
- Surface Arrangements
- Access

Networking Break

Circulation Systems
- Natural Circulation
- Forced Circulation
- Steam Drums
- Headers
- Saturated and Superheated Steam

HRSG Components
- Economizer
- Evaporator
- Superheater
- Reheater
- Steam Drum
- Headers
- Entrance Duct
- Walls
- Linings
- Support Steel

“This course is a good overview for any engineer new to this topic.”

Mechanical Engineer, Express Integrated Technologies

“This course alongside the Combined Cycle Fundamentals course will help new employees with little or no experience in the power generation field. This course helped me understand how the plant works outside my office.”

Operation Support Specialist, Puget Sound Energy
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AGENDA

WEDNESDAY, OCTOBER 17, 2018 (CONTINUED)

Heat Management
- High, Intermediate, and Low Pressure
- Gas Temperature Management
- Integration With The Steam Cycle
- Supplementary Firing
- Heat and Mass Balances
- Gas Path
- Water Path
- Cooling Tower

Group Luncheon

Integration with the Combined Cycle
- Hot Gas Source
- Steam Turbine
- Condenser
- Cooling Tower
- Feedwater Train

Water Chemistry
- Requirements
- Water Treatment
- Potential for Internal Corrosion

Emissions Control
- Source of Emissions
- SCR
- CO Catalyst

Networking Break

Balance of Plant Equipment
- Pumps
- Valves
- Instrumentation
- Compressed Air

Controls
- Desuperheater
- Drum Level
- Water Chemistry
- Start Up
- Isolated Economizers
- Feedwater Storage
- Drain and Vent Systems
- Blowdown

“Very informative.”
Mechanical Engineer, Express Integrated Technologies

“Great course. Would recommend it for anyone involved with HRSG projects.”
Project Manager, SCS Engineers

“This EUCI course is a great entry-level exposure to HRSG fundamentals.”
Quality Engineer, Hamon Deltak, Inc.
Carl R. Bozzuto
Honorary Member, The Council of Industrial Boiler Owners

Carl Bozzuto has nearly 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 Bozzuto is very informed about HRSG. This venue is one of the few such available to outsiders such as myself. EUCI has put together a great presentation. Very useful!”

Sr. Piping Technologist/Project Manager, Stress Engineering Services, Inc.
INSTRUCTIONAL METHODS

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

REQUIREMENTS FOR SUCCESSFUL COMPLETION

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

EVENT LOCATION

A room block has been reserved at the Hilton Garden Inn Arlington/Courthouse Plaza, 1333 North Courthouse Road Arlington, VA 22201, for the nights of October 14-17, 2018. Room rates are $189 plus applicable tax. Call 1-703-528-4444 for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is September 14, 2018 but as there are a limited number of rooms available at this rate, the room block may close sooner. Please make your reservations early.

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.

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**SPECIAL RATE FOR 3 COURSES: COMBINED CYCLE POWER PLANT FUNDAMENTALS, HEAT RECOVERY STEAM GENERATOR (HRSG) FUNDAMENTALS AND SAFETY CONSIDERATIONS IN COMBINED CYCLE PLANTS**
- October 15-18, 2018: US $2595
  - EARLY BIRD on or before SEPTEMBER 28, 2018: US $2395

**BOTH COMBINED CYCLE POWER PLANT FUNDAMENTALS AND HEAT RECOVERY STEAM GENERATOR (HRSG) FUNDAMENTALS COURSES:**
- October 15-17, 2018: US $1995
  - EARLY BIRD on or before SEPTEMBER 28, 2018: US $1795

**HEAT RECOVERY STEAM GENERATOR (HRSG) FUNDAMENTALS COURSE ONLY:**
- October 17, 2018: US $895
  - EARLY BIRD on or before SEPTEMBER 28, 2018: US $795

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

Print Name

Job Title

Company

What name do you prefer on your name badge?

Address

City

State/Province

Zip/Postal Code

Country

Phone

Email

List any dietary or accessibility needs here

**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
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 September 14, 2018 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 the event 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 (201) 871-0474.