HEAT RECOVERY STEAM GENERATOR (HRSG) FUNDAMENTALS

July 1, 2020
Online | Central Time

EUCI ONLINE COURSE

EUCI is pleased to offer this virtual course on its online interactive platform. Enjoy a valuable learning experience with a smaller impact on your time and budget. You will gain new knowledge, skills, and hands-on experience in from the comfort of your remote location.

RELATED EVENT:

COMBINED CYCLE POWER PLANT FUNDAMENTALS
June 29-30, 2020 | Online

“Excellent training and valuable education. Great value.”
General Engineer, National Institutes of Health

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EUCI is authorized by IACET to offer 0.8 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 HRGS 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, JULY 1, 2020 - CENTRAL TIME

9:00 – 9:15 am  Login and Welcome
9:15 am – 5:00 pm  Course Timing
12:30 – 1:15 pm  Lunch Break

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

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

WEDNESDAY, JULY 1, 2020 - CENTRAL TIME (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

“ Able to answer all of my questions. Very informative person with experience.”
Mechanical Engineer, National Institutes of Health

“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 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 has a deep understanding of the material and relevant experience as shown by his examples.”
Utilities Engineer, CPUC

“Mr. Bozzuto is highly knowledgeable in the application of industrial plants, power sector, and energy. The course is easy to follow from his presentation style.”
Senior Project Manager, WGL Energy
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.
  - 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 0.8 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 May 30, 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 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 303-770-8800. EUCI reserves the right to alter this program without prior notice.

**PLEASE SELECT**

- **BOTH COMBINED CYCLE POWER PLANT FUNDAMENTALS AND HEAT RECOVERY STEAM GENERATOR (HRSG) FUNDAMENTALS COURSES:** JUNE 29-JULY 1, 2020: US $1895
- **HEAT RECOVERY STEAM GENERATOR FUNDAMENTALS COURSE ONLY:** JULY 1, 2020: US $895
- **PACK OF 5 CONNECTIONS (HRSG):** US $4,025
- **PACK OF 10 CONNECTIONS (HRSG):** US $6,715

For volume discounts call +1.303.770.8800 for quote

* all other discounts do not apply to license packs

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**REGISTRATION INFORMATION**

**Mail Directly To:**
EUCI
6400 S Fiddlers Green Cir., Suite 1620
Greenwood Village, CO 80111
OR, scan and email to: conferences@euci.com

**Online Course Delivery & Participation Details**

See page 6 for information

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**ENERGIZE WEEKLY**

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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**WWW.EUCI.COM**
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**How did you hear about this event?**

(please email, colleague, speaker(s), etc.)

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**Print Name**

**Job Title**

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**CREDIT CARD INFORMATION**

**Name on Card**

**Billing Address**

**Account Number**

**Billing City**

**Billing State**

**Exp. Date**

**Billing Zip Code/Postal Code**

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

**OR Enclosed is a check for $**

**to cover**

**registrations.**

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