Texas Industries of the Future

SECO
State Energy Conservation Office

HBR

STEAM AND COGENERATION SYSTEM ASSESSMENT WORKSHOP

Tuesday, July 23, 2019
8:00 a.m. to 4:30 p.m.
Houston Business Roundtable
5213 Center Street Pasadena, Texas 77505

Description: Steam is central to the operation of most industrial facilities. Typically, steam systems comprise one of the largest operating costs associated with an industrial plant. This course will cover the operation of typical steam systems and will discuss methods of system efficiency improvement. The course is divided into three major categories:

- Steam Generation Efficiency
- Resource Utilization Effectiveness
- Steam Distribution System Management

The following is a general description of the course content.

In the *Steam Generation Efficiency* category of the course the boiler is investigated and the target is obtaining optimum steam generation efficiency. The concept of efficiency is thoroughly investigated and the factors affecting efficiency are identified. Typically, the major avenue of loss associated with boiler operation is energy carried from the system with the flue gas exiting the boiler. Flue gas heat recovery and excess air control are major components associated with this loss. These areas will be
covered in the course as well as other areas of efficiency impact such as, blowdown, water quality, and boiler shell integrity.

Resource Utilization Effectiveness is a very broad category encompassing fuel selection, combined heat and power systems, steam system balancing, and steam end users. These investigation areas can have significant impact on the economics of a facility. Facilities capable of utilizing multiple fuels can realize significant savings as a result of fuel price differences. Combining generation of the supply for a site's thermal demand with the electrical demand can result in major improvements in overall cost effectiveness. The course covers the basic concepts of steam turbine operation and the economic impacts of supplying steam exported from turbines.

Steam Distribution System Management is a major challenge in many systems. Identifying and reducing the sources of loss in a system will be discussed. Several focus areas are incorporated in this category, including:

- Steam leaks: Pipe failures and Steam trap failures
- Heat transfer loss through insulation
- Condensate loss: Condensate worth and Recovery system considerations

These areas are fundamental in the field of energy management and generally result in attractive economics when savings opportunities are identified. For each of the categories the presentation goes into the details of the equipment and the theory of operation. The measurements required for appropriate management of each area will be identified. The economic impact of each area will also be identified. Many case studies will be presented from steam system assessments conducted by the instructor.

PDH Credits: Attendees will be issued a certificate for 7 hours of PDH credits.

Instructor: Dr. Harrell developed the United States Department of Energy (USDOE) BestPractices Steam End-User Training and the USDOE Steam Specialist Qualification Training. He played a major role in the development of the USDOE BestPractices Steam Tools. He authored the Steam System Survey Guide and the Boiler Tune-Up Guide for Natural Gas and Light Fuel Oil Operation. He served as the lead author for the American Society of Mechanical Engineers (ASME) Energy Assessment for Steam Systems Standard ASME EA-3-2009 and the Guidance Document for that standard. He serves as one of the Lead Developers, Technical Advisors, and Instructors of the United Nations Industrial Development Organization (UNIDO) Steam and Cogeneration System Assessment Program.

Dr. Harrell has conducted many energy assessments for industrial clients throughout the world. Industrial assessments and training courses have been completed on six continents in twenty-eight countries and in thirty-eight of the United States.

Dr. Harrell currently serves as the Director of Engineering Programs at Milligan College where he teaches mechanical engineering. He has served on the faculty at Virginia Tech and at the Institute for a Secure and Sustainable Environment (ISSE) of The University of Tennessee. While completing his doctoral degree he served as a mechanical engineer for the Energy Management Institute at Virginia Tech. From 1997 to 2001 he served as the Director of Technical Assistance for the institute. From 1987 to 1993 Dr. Harrell worked as a design engineer and utilities process engineer for BASF Corporation at a large industrial complex.

Sponsors: Texas Industries of the Future, State Energy Conservation Office of the Texas Comptroller of Public Accounts, and Houston Business Roundtable.

Cost:
Early Bird Discount - Register by July 12, 2019: $40; Late Registration on or after July 12: $60

How to Register: Fax the Registration Form to 713-645-2812 OR Email msaulter@houbrt.com

REGISTRATION FORM

For

STEAM AND COGENERATION SYSTEM ASSESSMENT WORKSHOP

HBR Training Center
5213 Center Street
Pasadena, Texas

Tuesday, July 23, 2019
8:00 a.m. to 4:30 p.m.
Lunch Provided

Fee: $40 – Until July. 12; $60 on or after July 12

Fax this form to: 713-645-2812 OR Email to: msaulter@houbrt.com

Name	
Company	
Telephone	
Mailing Address	
E-mail	

PAYMENT OPTIONS

Mail Check to:	Houston Business Roundtable 5213 Center Street Pasadena, TX 77505
Charge Credit Card:	Acct # EXP.
	CVC Code
	We accept VISA/MasterCard/American Express/Discover Only

Please cancel your reservation by July 5th at 5 PM or you will be charged for the workshop.

Pre-payment is required for all non-HBR members/subscribers