

UPCOMING EVENTS

Secondary Steelmaking Refractories –
A Practical Training Seminar
6–7 October 2020
Virtual Meeting

Environmental Solutions: Meeting EPA Air
Emission Requirements
19–20 October 2020
Virtual Meeting

The Making, Shaping and Treating of Steel: 101
4–5 November 2020
Virtual Meeting

Modern Electric Furnace Steelmaking –
A Practical Training Seminar
1–5 February 2021
Nashville Marriott at Vanderbilt University
Nashville, Tenn., USA


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STEEL MILL COMBUSTION AND THERMAL SYSTEMS

27–28 OCTOBER 2020
Virtual Meeting

ABOUT THE PROGRAM

Approximately 20% of the cost of producing steel is energy, and of this, a large component is fuel for thermal processing. Additionally, proper maintenance and operation of the thermal systems in a steel plant have ramifications on safety, profitability, product quality and environmental emissions. The seminar will be held in a classroom setting to encourage active discussion and sharing of experiences among participants. The goal of the seminar will be to give students the basic knowledge and operating background to assess and understand the condition of their combustion system equipment. Attendees will also be given exposure to the latest techniques for upgrade and optimization of their systems. The relationship of hardware and controls will be highlighted. Case studies and hands-on equipment samples will be provided to complement theoretical analysis. Applied combustion topics such as the use of sensors and diagnostics, advanced energy optimization techniques like thermal recovery and use of pure oxygen, as well as selection of refractory materials, will be covered.

WHO SHOULD ATTEND

This training seminar is designed for supervisors, engineers, and technicians who are directly involved in the operation, maintenance, design or installation of combustion equipment in steel mills. Other attendees who would benefit from this seminar include risk managers, safety personnel, utility personnel who manage fuels utilization, purchasing personnel who procure utilities and environmental engineers who are responsible for air quality. This training would also benefit the energy engineers/managers who are responsible for energy efficiency and optimization on-site.

PROFESSIONAL DEVELOPMENT HOURS

This course may qualify for up to 18 Professional Development Hour (PDH) credits. Each attendee will receive a certificate listing the quantity of PDH credits earned for the course. This course is not approved for PDH credits in New York, Florida, North Carolina and Oklahoma. This course is not approved for PDH credits in New York, Florida, North Carolina and Oklahoma.

ORGANIZED BY

AIST's Energy & Utilities Technology Committee.

REGISTRATION INCLUDES

Live virtual instruction via individual link; electronic access to course material; networking opportunities; and live Q&A with instructors

AIST MEMBERS

US\$295

NON-MEMBERS

US\$445

ATTENTION NON-MEMBERS

Non-member registration fees include membership in AIST through 31 December 2021. Membership is not automatic. A completed membership application must be returned to AIST.



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SCHEDULE OF EVENTS



Tuesday, 27 October 2020

7:30 a.m.

Conference Opening Remarks

8 a.m. EST

Combustion and Burner Fundamentals

Anup Sane, Air Products

8:45 a.m. EST

Blowers and Fans

Jim Conway, New York Blower Co.

Fundamentals of fan performance, operation and control in combustion systems.

9:30 a.m. EST

Break

9:45 a.m. EST

Helping Address the World's Most Critical Flow Measurement Needs

David Taplin and Mark Sagstetter, Emerson Automation Solutions

This presentation will discuss flow measurement best practices. By reviewing common precision flow measurement technologies, attendees will be able to solve the most challenging flow applications.

11 a.m. EST

Combustion System Reliability Improvements Disguised as Safety Code Compliance

John Puskar, Prescient Technical Services LLC

For those who operate fuel-fired equipment, NFPA 86, The Standard for Ovens and Furnaces, should be their best friend. Embracing compliance can result in safer operations, improved reliability and even energy savings. This standard applies to all ovens and furnaces within steelmaking and processing facilities. In addition to covering other major parts of the standard, best practices will be provided that describe reliability enhancements to design failure out of combustion systems and fuel trains. Looking hard at compliance will mean that a company likely does not comply with the most current code. Conducting a gap analysis will be discussed in order to move forward with at least a plan for compliance with the most current standard available. Standards typically change because much continues to be learned about configuring, operating and maintaining fired systems more safely with fewer risks. Current standards reflect the most advanced information available for safer fired equipment operations.

Noon

Lunch Break

1 p.m. EST

Combustion System Maintenance

Mark Kampe, Honeywell Combustion Safety

This presentation will cover code-required testing, maintenance procedures, burner tuning, combustion troubleshooting tips and hazard recognition. The goal is to find and correct problems before they become critical.

1:45 p.m. EST

Combustion Control Components/Hardware/Burner Management Systems

Mark Kampe, Honeywell Combustion Safety

This presentation will provide an overview of combustion system components, safety interlocks and common control systems.

2:45 p.m. EST

Break

3 p.m. EST

Solving Your Burning Problems: Combustion Sensors and Diagnostics

Vi Rapp, Lawrence Berkeley National Laboratory

Measuring the appropriate process variables to diagnose combustion systems is critical for ensuring the system operates efficiently and cleanly. This presentation will review important process variables and related sensors needed to evaluate and diagnose a combustion system. Specifically, this presentation will discuss how to use the equipment to control the combustion process and how to diagnose potential problems. It will also include an overview of technologies and equipment used at Berkeley Lab.

3:45 p.m. EST

Environmental Emissions

Michael Cochran, Bloom Engineering Co. Inc.

4 p.m. EST

Combustion and the Environment - NO_x and CO₂ Emissions

Keenan Cokain, Bloom Engineering Co. Inc.

This presentation will cover why NO_x emissions are regulated; how NO_x forms in a combustion system; how to reduce NO_x emissions. In addition to NO_x, this talk will also provide an introduction to CO₂ emissions.

4:30 p.m. EST

Questionnaire of Topics From Day 1

5 p.m. EST

Adjourn

Wednesday, 28 October 2020

7:45 a.m.

Opening Remarks

8 a.m. EST

Advanced Energy Optimization Heat Recovery Systems Oxy-Fuel Combustion

Michael Cochran, Bloom Engineering Co. Inc., and Anandkumar Makwana, Air Products

This talk will explore existing techniques to enhance energy efficiency and an overview of fundamentals of oxy-fuel combustion. Additionally, comparison of oxy-fuel combustion to traditional air/fuel combustion system is presented.

9 a.m. EST

Role of Refractory in Reheat Furnaces

Greg Odenthal, International Technical Ceramics LLC (ITC)

This presentation provides attendees with an understanding of the role and importance of refractories in a reheat furnace and how they relate to fuel consumption and energy loss as well as product quality.

9:45 a.m. EST

Break

10 a.m. EST

Energy Efficiency and Economics

Sachin Nimbalkar, Oak Ridge National Laboratory

Process heating accounts for about 70% of all process energy (energy applied to convert material into manufactured products) used in the U.S. manufacturing sector. During this session, the audience will learn practical tips on process heating maintenance, how to improve the energy efficiency of furnaces and how to use the U.S. Department of Energy's MEASUR tool (Process Heating Assessment module). MEASUR helps survey furnaces and heaters identify major energy-using equipment, prioritize improvement opportunities and assess available methods to improve thermal efficiency in industrial plants.

11 a.m. EST

Steel Mill Combustion and Thermal Systems

Kurt Johnson, ArcelorMittal USA Research Laboratories

A virtual scavenger hunt through a steel mill for ideas to improve efficiency, productivity, quality, safety and emissions, this presentation serves as a practical guide to likely improvement opportunities for a multitude of steel mill processes.

Noon

Lunch Break

1 p.m. EST

CFD Application in the Steel Industry 1: Fundamentals and Applications, EAF, Blast Furnace and Reheat Furnace

Chenn Zhou, Center for Innovation Through Visualization and Simulation, Purdue University Northwest
Advanced simulation and visualization technologies are increasingly playing a key role for energy reduction in steel manufacturing. These technologies can provide coherent understandings of complex phenomena and processes, and enable faster and better decision-making for process design, optimization, troubleshooting and training. The Steel Manufacturing Simulation and Visualization Consortium (SMSVC) has been formed with the mission to develop and implement innovative technical solutions, through the integration of advanced computer simulation and visualization technologies, for the value chain of U.S. steel manufacturing. Energy efficiency is a major focus in SMSVC research. To-date research outcomes include improved energy efficiencies and identification of energy reduction opportunities. This presentation will include an overview of the SMSVC, simulation and visualization technologies and methodologies, as well as high-impact project examples.

2 p.m. EST

CFD Application in the Steel Industry 2: Oxy-Fuel Combustion Applications

Xiaoyi He, Air Products and Chemicals Inc.

Oxygen-fuel combustion offers unique benefits to many high-temperature applications in steel/iron production processes. As a powerful design and research tool, computational fluid dynamics modeling plays an important role in improving efficiency and reducing operational risks from the oxy-fuel combustion. The presentation will discuss the best practice and previous experience by Air Products in this field.

3:15 p.m. EST

Roundtable Discussion and Course Wrap-Up

Panelists: Sachin Nimbalkar, Oak Ridge National Laboratory, Kurt Johnson, ArcelorMittal USA Research Laboratories, Chenn Zhou, Center for Innovation Through Visualization and Simulation, Purdue University Northwest, Greg Buragino, Air Products and Russ Chapman, Firebridge Inc.

4:30 p.m. EST

Conference Adjourn