



# Steel Mill Combustion and Thermal Systems

21–23 March 2017  
Nashville, Tenn., USA  
The Holiday Inn Nashville-Vanderbilt





## About the Program

Approximately 20% of the cost of producing steel is energy. 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.

This seminar will provide 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 course will highlight the relationship of hardware and controls. 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, and selection of refractory materials will be covered. The seminar will be held in a classroom setting to encourage active discussion and sharing of experiences among participants.

## 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 will benefit from this seminar include risk managers, safety personnel, utility personnel managing fuels utilization, purchasing personnel who procure utilities and environmental engineers responsible for air quality.



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## Organized By

AIST's Energy & Utilities Technology Committee.

# Schedule of Events

## Tuesday, 21 March 2017

4 p.m.  
Registration

6 p.m.  
Welcome Reception

## Wednesday, 22 March 2017

7 a.m.  
Registration and Continental Breakfast

8 a.m.  
**Combustion Fundamentals**  
Shailesh Gangoli, Air Products & Chemicals Inc.  
General overview of key process variables in steel mill combustion operations, their role and implications on the process efficacy.

8:45 a.m.  
**Burner Fundamentals**  
Ben Gatto, Honeywell Thermal Solutions  
Session to cover background of burners found at steel mills. The goal is to build a foundation that can be used to assess the condition and performance of equipment.

9:30 a.m.  
Break

9:45 a.m.  
**Combustion Gas and Air Flow: Piping, Design, DP and Measurement**  
Ron Davis, FCX Performance  
A practical look at various aspects of piping and how they affect flow measurement. Evaluation of pipe size, differential pressure, system pressure loss and motive force are covered.

11 a.m.  
**Blowers and Fans**  
Dan Banyay, Robinson Fans  
Provide technical insight into proper specification, selection, installation, maintenance and operation of fans in combustion systems.

11:45 a.m.  
Lunch

1 p.m.  
**Combustion Safety Standards**  
Bryan Baesel, CEC Combustion Safety

1:45 p.m.  
**Combustion System Maintenance**  
Mark Kampe, CEC Combustion Safety

2:30 p.m.  
Break

2:45 p.m.  
**Combustion Control Components/  
Hardware/Burner Management System**  
Mark Kampe, CEC Combustion Safety

3:45 p.m.  
**Combustion Sensors and Diagnostics**  
Chuck Grantham, Charter Steel

4:45 p.m.  
Reception

## Thursday, 23 March 2017

7 a.m.  
Continental Breakfast

8 a.m.  
**Questionnaire and Interactive Discussion  
of Day 1**

8:15 a.m.  
**Advanced Energy Optimization: Heat  
Recovery Systems Oxy-Fuel Combustion**  
Michael Cochran, Bloom Engineering Co. Inc., and Anup Sane, Air Products & Chemicals Inc.  
Two ways to enhance combustion efficiency at high temperatures are regenerative heat recovery and oxy-fuel combustion. This talk discusses the merits and challenges associated with each method.

9:15 a.m.

### **Steel Mill Thermal Emissions**

Matt Valancius, Bloom Engineering Co. Inc.

NO<sub>x</sub> and CO<sub>2</sub> causes and abatement strategies.

10 a.m.

Break

10:15 a.m.

### **Role of Refractories in Reheat Furnace**

Greg Odenthal, International Technical  
Ceramics LLC

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.

11 a.m.

### **Energy Efficiency and Economics**

Kurt Johnson, ArcelorMittal USA Research  
Laboratories

An overview of how to evaluate heating system efficiency will be presented, including the use of software tools and other resources. Various methods to improve efficiency will be examined to illustrate viable approaches to identifying and implementing an improvement project.

11:45

Lunch

1 p.m.

### **Combustion Troubleshooting Case Studies**

2 p.m.

### **Steel Mill Combustion and Thermal Systems**

Kurt Johnson, ArcelorMittal USA Research  
Laboratories

3 p.m.

### **Questionnaire and Interactive Discussion of Day 2**

## Registration

### AIST Members

**US\$695**

by 7 February 2017

**US\$795**

after 7 February 2017

### Non-members

**US\$910**

by 7 February 2017

**US\$1,010**

after 7 February 2017

## Registration Includes

A Tuesday and Wednesday reception, Wednesday and Thursday continental breakfast and lunch, and a course workbook or flash drive including presentations.

## Hotel Accommodations

A block of rooms has been reserved at The Holiday Inn Nashville-Vanderbilt. Please call the hotel at +1.877.327.4707 by 21 February 2017 to secure the AIST discount rate of US\$175 per night for single/double occupancy.



## Upcoming Events

- > Scrap Supplements and Alternative Ironmaking 7  
19–21 February 2017  
Wyndham Lake Buena Vista > Orlando, Fla., USA
- > Rod and Bar Rolling  
21–23 February 2017  
The Atlanta Marriott Marquis > Atlanta, Ga., USA
- > Cold Rolling Fundamentals — A Practical Training Seminar in conjunction with System Automation Fundamentals  
5–9 March 2017  
Hyatt Regency Indianapolis > Indianapolis, Ind., USA
- > The Making, Shaping and Treating of Steel: 101  
7–9 March 2017  
The Edward Hotel and Convention Center > Dearborn, Mich., USA



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