Energy and Utilities

Industry Insights and Fundamentals Workshop

7–10 October 2019

Oak Ridge National Laboratory
Oak Ridge, Tenn., USA

About the Program

Energy is the second-greatest cost of conversion in the steel industry. Improving energy efficiency will drive down costs in the production of steel. This comprehensive training, with hands-on activities, has been developed to educate attendees on the key aspects of these important utilities in the steel production process. The seminar is a joint effort between the AIST Energy & Utilities Technology Committee and the U.S. Department of Energy's Better Buildings Initiative.

The subject matter includes electricity, compressed air, thermo processes, along with an introduction to alternative energy options. The course will focus on the energy-efficiency and -saving aspects of each utility along with insights to improving reliability. Tools for energy calculations for specific utilities will be discussed. Oak Ridge National Laboratory, home of the world's most powerful supercomputer, is an ideal location for the latest in technical equipment for hands-on training. As an example, the hands-on sessions will provide in-depth understanding of how motor/drive systems operate and can result in energy savings.

In addition, there will be in-depth training related to overall plant energy savings programs, providing insights into what it takes to implement a long-term strategic plan. The instructors are nationally recognized experts from Oak Ridge National Laboratory and the U.S. Department of Energy, as well as steel industry experts.

Attendees will also have an opportunity to see the latest technological developments at Oak Ridge National Laboratory, including a tour of the world's fastest supercomputer and the world's largest concentration of 3D printing equipment. These aspects of the tour are intended to illustrate the opportunities available for collaborative research and for creating full-scale replacement parts via additive manufacturing.

Organized By

AIST's Energy & Utilities Technology Committee and

OAK RIDGE National Laboratory

Better Plants

ENERGY STAR

Who Should Attend

The tools and programs presented will be beneficial to individuals or plants wanting to implement an energy optimization plan (long term or short term) in all areas of steel manufacturing. Energy managers and engineers, facility managers, electrical managers and electrical project engineers and management personnel with oversight responsibility for plant utilities should consider this course. The workshop offers a great overview for new engineers, providing a basic understanding of energy-related aspects of utilities in steelmaking and a foundation to recognize and implement energy savings projects.

Registration Includes

Registration includes welcome reception Monday, breakfast and lunch Tuesday and Wednesday, and a course workbook or flash drive including presentations. *Please note that all registrations must be submitted by Thursday, 26 September, so that Oak Ridge National Laboratory can complete any security clearances.*

Hotel Accommodations

A block of rooms has been reserved at the Embassy Suites by Hilton Knoxville West. Please call the hotel at +1.865.246.2309 by 16 September 2019 to secure the AIST discount rate of US$149 per night for single/double occupancy.

AIST Members		AIST Non-Members	
US$845	US$945	US$1,090	US$1,190
by 26 August 2019	after 26 August 2019	by 26 August 2019	after 26 August 2019

Featured Plant Tour:

Oak Ridge National Laboratory

AIST.org

Upcoming Events

Maintenance & Reliability for the Next Generation
10–12 September 2019
Embassy Suites by Hilton Indianapolis Downtown
Indianapolis, Ind., USA

Pipe and Tube — A Practical Training Seminar
23–26 September 2019
DoubleTree Birmingham Perimeter Park
Birmingham, Ala., USA

Secondary Steelmaking Refractories — A Practical Training Seminar
14–17 October 2019
Hilton Palacio Del Rio
San Antonio, Texas, USA

The Making, Shaping and Treating of Steel: 101
29–30 October 2019
Hilton Milwaukee City Center
Milwaukee, Wis., USA

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Schedule of Events

Monday, 7 October 2019

4–6 p.m.
Registration at Embassy Suites by Hilton Knoxville West

6–7 p.m.
Welcome Reception at Embassy Suites by Hilton West

Tuesday, 8 October 2019

7:45 a.m.
Bus departs for Oak Ridge National Laboratory

8:15 a.m.
Registration at Oak Ridge National Laboratory

9 a.m.
Introductions and Opening Remarks
Lou York, Case Engineering Inc., Larry Fabina, ArcelorMittal Burns Harbor, and Xin Sun, Oak Ridge National Laboratory

9:15 a.m.
Introduction to Energy Management
Betsy Dutrow, U.S. Environmental Protection Agency, and Eli Levine, U.S. Department of Energy, Better Plants Program
This session will explain energy management and why it works and share tools and no-cost guidance available to help the industry.

10:15 a.m.
Break

10:30 a.m.
Training Session on Energy Management Systems, Industrial Energy Efficiency Standard ISO 50001, and DOE's 50001 Ready Navigator Tool
Thomas Wenning, Oak Ridge National Laboratory, and Rishabh Bahel, ArcelorMittal Cleveland
This session provides an overview on the DOE's training, tools and resources on energy management for manufacturers that can help in implementing an ISO 50001-compliant energy management system. The presenters will also introduce the audience to the DOE's 50001 Ready Navigator Tool, which helps manufacturers walk through the process of implementing an energy management system, track progress and collaborate with teams.

11:15 a.m.
Baselining and Benchmarking Plant Energy Performance
Sachin Nimbalkar, Oak Ridge National Laboratory, Larry Fabina, ArcelorMittal Burns Harbor, and Betsy Dutrow, U.S. Environmental Protection
This session will discuss available approaches for energy benchmarking that evaluate energy efficiency in a steel plant. Attendees will learn about: ePlant Energy Profiler, Energy Footprint, Energy Performance Indicator (EnPI) Tools and ENERGY STAR Benchmark Tool for Integrated Steel Mills.

Noon
Lunch

1 p.m.
Industrial Steam Systems – Energy Losses, Energy Efficiency Opportunities and DOE's Steam Tools and Resources
Thomas Wenning, Oak Ridge National Laboratory
Many manufacturing facilities can recapture energy by installing more efficient steam equipment and processes and applying energy management practices. This session provides an overview on DOE software tools on steam system, (MEASUR, steam system modeler tool, steam system scoping tool, etc.), training, and other resources to optimize steam system performance and save energy.

2:15 p.m.
Industrial Process Heating – Energy Losses, Energy Efficiency Opportunities and DOE's Process Heating Assessment Tool and Resources, Combined Heat and Power, and Waste Heat Recovery Technologies
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 DOE'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.

3:15 p.m.
Break

3:45 p.m.
Lighting Energy Savings and Challenges Within the Iron and Steel Industry
Wei Guo, Oak Ridge National Laboratory
Lighting systems are one of the major energy end users for manufacturing facilities. This session covers various lighting technologies (CFL, HID, LED, etc.), lighting system control strategies (occupancy censors, light level sensors, etc.) and energy savings opportunities.

4:15 p.m.
Smart Manufacturing and Internet of Things for the Iron and Steel Industry
Lou York, Case Engineering Inc.
This session will utilize case studies to demonstrate the potential of smart manufacturing and Internet of Things technologies to enhance operational performance and productivity in the iron and steel industry. The iron and steel industry appears eager to implement smart manufacturing technologies. Steel producers seek to optimize their production lines by using smart technologies to reveal bottlenecks and identify performance-reducing nodes.

5 p.m.
Return From Oak Ridge National Laboratory

Wednesday, 9 October 2019

7:45 a.m.
Bus Departs for Oak Ridge National Laboratory

8:30 a.m.
Motors and Motor-Driven Systems (Fans, Pumps and Drives) – Energy Losses, Energy Efficiency Opportunities and DOE's PSAT and FSAT Tools and Other Resources
Daryl Cox, Oak Ridge National Laboratory
It is estimated that motor-driven systems account for 65% of the electricity consumed by industry, with operating costs far outweighing the initial purchase price. The presentation will discuss both motor and motor-driven system efficiency. Techniques to quantify energy-saving opportunities will be discussed (including use of the DOE MEASUR software tool) and a portable flow loop will be used to demonstrate some of the principles discussed as they relate to pump and fan systems.

10 a.m.
Break

10:15 a.m.
Compressed Air System – Energy Losses, Energy Efficiency Opportunities and DOE's AirMaster+ Tool and Other Resources
Kiran Thirumaran, Oak Ridge National Laboratory
Compressed air systems consume around 7.6% of the total electricity used for production in the U.S. manufacturing sector. With almost 80% of this input electricity being dissipated as heat, compressed air is a very expensive resource, with significant potential for energy savings. The presentation will discuss the pros and cons of the different compressor configurations and its controls with examples from the field. In addition to providing background information on compressed air usage in the iron and steel industry, commonly identified compressed air energy efficiency opportunities are also discussed. The various resources developed by the Department of Energy specifically for modeling and identifying opportunities in compressed air system, including the AirMaster+ tool, are presented along with a brief demonstration.

11:15 a.m.
Energy Efficiency Primer on Water/Wastewater Treatment Operations
Wei Guo, Oak Ridge National Laboratory
In the iron and steel sector, water management aims at improving the sustainability of the production cycle, resulting in resource efficiency benefits and in reduced water demand and costs. This session will cover energy and water efficiency opportunities in on-site water/wastewater treatment operations in iron and steel plants.

Noon
Working Lunch

1 p.m.
Utility Bill Overview and Incentive Review
Rishabh Bahel, ArcelorMittal Cleveland
The presentation will cover the basic components of a utility bill and the key components to keep a track of. It will train the utility personnel to look out for potential savings in the bill.

1:45 p.m.
Alternative Energy Generation
Brendan O'Brien, Burns & McDonnell
This presentation will provide a 50,000-foot view of available on-site technologies for power product at industrial facilities. Traditional gas combustion turbine and cogeneration solutions will be presented, as well as alternative energy sources such as wind, solar and battery technology. Typical efficiencies, project costs, durations and required site requirements will be presented for each technology. Finally, the Organic Rankine cycle, which has being utilized at various steel mills for heat recovery, will be summarized.

2:30 p.m.
Break

2:45 p.m.
Simulation and Visualization for Energy Reduction in Steel Manufacturing
Chenn Zhou, 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.

4:15 p.m.
Roundtable Discussion
Moderators: Sachin Nimbalkar, and Larry Fabina
Panelists: Chenn Zhou, CIVS, Purdue University Northwest; Lou York, Case Engineering Inc.; Rishabh Bahel, ArcelorMittal Cleveland; and Ethan Rogers, U.S. Department of Energy, Better Plants Program,

5 p.m.
Return From Oak Ridge National Laboratory

Thursday, 10 October 2019

7:30 a.m.
Bus Departs Hotel for Oak Ridge Manufacturing Demonstration Facility

8:15 a.m.
Tour of Oak Ridge Manufacturing Demonstration Facility
Additive manufacturing (using electron beam, ultrasonic and laser metal deposition methods).

9 a.m.
Transfer to Main Oak Ridge National Laboratory Campus

9:30 a.m.
Tour of Manhattan Project Nuclear Reactor Museum
The original graphite reactor that heralded the atomic age (world's first installation in 1943), and key to the Manhattan Project.

10 a.m.
Bus Transfer to Supercomputer Overlook

10:15 a.m.
Tour of Supercomputers
High-performance computing and advanced data visualization analytics (using SUMMIT and EVEREST), currently two of the top 10 fastest computers in the world.

10:45 a.m.
Break

11 a.m.
Transfer to Oak Ridge Advanced Material Characterization Facility and Tour Spallation Neutron Source Facility
Research into new material properties using a neutron source accelerator.

12:15 p.m.
Return to Hotel From Oak Ridge Manufacturing Demonstration Facility

12:30 p.m.
Adjourn Conference