Energy and Utilities
Industry Insights and Fundamentals Workshop
7–10 October 2019
Oak Ridge National Laboratory
Oak Ridge, Tenn., USA

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.

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

Featured Plant Tour:
Oak Ridge National Laboratory

AIST.org
Wednesday, 9 October 2019
8:30 a.m.
Industrial and Mobile-Driven Systems (Fans, Pumps and Drives) — Energy Losses, Energy Efficiency Opportunities and DOE’s PSAT and FATool and Other Resources
Daryl Gray, Oak Ridge National Laboratory
It is estimated that motor-driven systems account for 65% of the electricity consumed by industry, with operating costs for overhauling 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 MEASURE software tool) and a portable flow loop tool 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. as an 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 systems, 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.
Lunch
1 p.m.
Utility Bill Overview and Incentive Review
Rishabth Bhatel, Acror-Mittel Cleveland
The presentation will cover the basic components of a utility bill and the key components to keep a track of it. We will train the utility personnel to look out for potential savings in the bill.
1:45 p.m.
Alternative Energy Generation
Brendan O’Donnell, Burns & McDonnell
This presentation will provide a 30,000-foot view of available on-site technologies for power production in the iron and steel industry. All of these technologies can help the industry.

Tuesday, 8 October 2019
7:45 a.m.
Bus Depart for Oak Ridge National Laboratory
9:30 a.m.
Registration at Oak Ridge National Laboratory
9 a.m.
Introductions and Opening Remarks
Low York, Case Engineering Inc.; Larry Falina, ArcelorMittal Burns Harbor and Kim Sun, Oak Ridge National Laboratory
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.
10:15 a.m.
Retrieving and Benchmarking Plant Energy Performance
Sachin Nimbalkar, Oak Ridge National Laboratory; Larry Falina, Acror-Mittal Burns Harbor and Betsy Couture, 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 Benchmarking 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 modeling tool, steam system scoping tool, etc.), training, and other resources to optimize steam system performance and save energy.
2:15 p.m.
Sachin Nimbalkar, Oak Ridge National Laboratory
Process heating accounts for about 78% of total process energy employed to convert material into finished goods in the 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 PSAT tool (Process Heating Assessment Model). 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
Wen 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 sensors, light level sensors, etc.), and energy savings opportunities.
4:15 p.m.
Smart Manufacturing and Internet of Things for the Iron and Steel Industry
Low 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

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

Thursday, 10 October 2019
7:30 a.m.
Bus Depart 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.
Transport to Oak Ridge National Laboratory Campuses
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.
Break
11 a.m.
Transfer to Oak Ridge Advanced Mechanical Characterization Facility and Test Quipulation Reactor Source Facility
Research into new material properties using a neutron source accelerators.
12:15 p.m.
Return to Hotel From Oak Ridge Manufacturing Demonstration Facility
12:30 p.m.
Adjourn Luncheon

Schedule of Events