



MODERN ELECTRIC FURNACE STEELMAKING

A PRACTICAL TRAINING SEMINAR

7-11 FEBRUARY 2022
Sheraton Orlando Lake Buena Vista • Orlando, Fla., USA
Plant Tour: Nucor Steel Florida

ABOUT THE PROGRAM

This course covers safety, the basics of electrical and mechanical features of electric arc furnaces, refractories, and the role of raw materials. The program will explore the fundamentals of electric furnace steelmaking technology, the use of energy inputs, the steelmaking process, electrodes and environmental concerns for electric steelmaking, including decarbonization. Attendees will also have the opportunity to learn how their operation compares to industry benchmarks, and to hear about the latest developing technologies. The midpoint of the conference includes a plant tour followed by an expert roundtable and reception with an open forum to discuss questions and challenges.

WHO SHOULD ATTEND

Those who wish to gain a fundamental understanding of the electrical, thermomechanical and technical aspects of modern electric furnace steelmaking. Electric arc furnace operators, maintenance personnel, upstream/downstream personnel, metallurgists and suppliers would benefit from this comprehensive seminar.

ORGANIZED BY

AIST's Electric Steelmaking Technology Committee.

PROFESSIONAL DEVELOPMENT HOURS

This course may qualify for up to 22.75 Professional Development Hour (PDH) credits. Each attendee will receive a certificate listing the quantity of PDH credits earned for this course. This course is not approved for PDH credit in New York, Florida, North Carolina and Oklahoma.



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UPCOMING EVENTS

Long Products Rolling – A Practical Training Seminar
22–24 February 2022
Sheraton Atlanta Hotel
Atlanta, Ga., USA

Sheet Processing and Finishing Lines – A Practical Training Seminar
20–23 March 2022
Sheraton Indianapolis City Centre Hotel
Indianapolis, Ind., USA

Digital Transformation Forum for the Steel Industry
14–16 March 2022
The Westin Indianapolis
Indianapolis, Ind., USA

Energy and Utilities Workshop – Roadmap to the Energy Efficient, Sustainable and Decarbonized Steel Industry
14–17 March 2022
Oak Ridge National Laboratory and Embassy Suites by Hilton Knoxville West
Oak Ridge, Tenn., USA



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REGISTRATION INCLUDES

Welcome reception Monday, breakfast Tuesday–Friday, lunch Tuesday–Thursday, reception Wednesday, plant tour with bus transportation, and a course workbook or flash drive including presentations.

HOTEL ACCOMMODATIONS

A block of rooms has been reserved at the Sheraton Orlando Lake Buena Vista. Please call the hotel at +1.407.239.0444 by 17 January 2022 to secure the AIST discount rate of US\$189 per night for single/double occupancy.

AIST MEMBERS

US\$1,195

Before 27 December 2021

US\$1,295

After 27 December 2021

NON-MEMBERS

US\$1,440

Before 27 December 2021

US\$1,540

After 27 December 2021



FEATURED PLANT TOUR

Nucor Steel Florida

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SCHEDULE OF EVENTS



Monday, 7 February 2022

4–6 p.m.
Registration

5–6 p.m.
Welcome Reception

Tuesday, 8 February 2022

7 a.m.
Registration and Breakfast

8 a.m.
Introductions

8:05 a.m.
Safety Presentation: The Day We Will Remember

Ricky Rollins, Ricky Rollins Safety Speeches
Ricky Rollins will tell the story of how he almost lost his life on a steel mill start-up and how it would have affected his family if he had died that day. He will also tell four more stories each with a different message/lesson for use at home and work.

9:15 a.m.
Break

9:30 a.m.
Chemistry of EAF Steelmaking – Chemistry Background and Introduction to Steel
Kyle Vanover, Steel Dynamics Inc. – Flat Roll Group Butler Division
The fundamentals of EAF steelmaking chemistry are presented in a way that will be informative to attendees having little background knowledge as well as those who are completely new to the topic.

10:30 a.m.
Break

10:45 a.m.
Chemistry of EAF Steelmaking – Focus on Oxidation, Carbon and Slag
Kyle Vanover, Steel Dynamics Inc. – Flat Roll Group Butler Division

Noon
Lunch

1 p.m.
EAF Efficiencies and Slag Fundamentals
Eugene Pretorius, Nucor Corp.
This presentation covers EAF slag fundamentals, transient slags, understanding the C/O/Fe balance and how it impacts energy efficiency (electrical and chemical) and material recoveries in the EAF, heel control in the EAF, slag retention, and bath level control.

2:30 p.m.
Break

2:45 p.m.
Chemical and Electrical Energy Inputs and EAF Performance
Sam Matson, CMC Americas
The presentation will cover the timing and relationship between the electrical energy input and chemical energy input. Tracking energy inputs and losses will be discussed, as well as their relationships to the timing and magnitudes of the energy inputs.

4 p.m.
LMF Metallurgy and Secondary Steelmaking

Helmut Oltmann, Nucor Steel–Berkeley
Raw steel tapped from the EAF is further processed in the ladle metallurgy furnace and delivered to the caster at the desired chemistry, temperature and time. Review of killing and alloying the steel, along with controlling the slag and non-metallic inclusions.

Wednesday, 9 February 2022

7 a.m.
Breakfast

8 a.m.
EAF Designs and Operations
Jeremy Jones, Continuous Improvement Experts (CIX Inc.)

9 a.m.
Break

9:10 a.m.
EAF Technologies – The Path to EAF Optimization
Jeremy Jones, Continuous Improvement Experts (CIX Inc.)

10:30 a.m.
Break

10:40 a.m.
Environmental Operations for the EAF
Sam Matson, CMC Americas
This presentation will review the main gaseous emissions, which part of the steelmaking process is likely to generate them, and potential ideas for how to reduce them. Also included will be an overview of air pollution control equipment operation.

Noon
Boxed Lunch

12:30 p.m.
Plant Tour of Nucor Steel Florida

4:30 p.m.
Reception and Roundtable Discussion

Panelists: Jeremy Jones, Continuous Improvement Experts (CIX Inc.); Eugene Pretorius, Nucor Corp.; Sam Matson, CMC Americas; Bob LaRoy, Steel Dynamics, Inc.–Flat Roll Group–Butler

Thursday, 10 February 2022

7 a.m.
Breakfast

8 a.m.
Food for the EAF: Everything You Need to Know About Raw Materials for the EAF
Zane Voss, CIX Inc.

The EAF is one of the most complicated chemical reactors in existence. One of the most important aspects of EAF operations is the choice of raw materials for the furnace. This presentation will go over the different varieties of furnace feedstock and suggest practical methods to determine the right material for optimal EAF performance.

9:45 a.m.
Break

10 a.m.
EAF Maintenance Requirements
Stephan Ferenczy, TCI Consultants Inc.
Typical electrical, mechanical and water-cooled equipment maintenance requirements will be discussed. Root-cause failure analysis techniques and practical solutions will be presented.

Noon
Lunch

1 p.m.
EAF Industry Perspective – Past and Future
Raymond Monroe, Steel Founders' Society of America
EAF steel production has grown rapidly to become, in North America, the dominant method of steel production. Reviewing the history of EAF development and especially the economic cycles and challenges of steel production allows for better management of production and business plans. This presentation will give an overview of the economic factors that help understand the current and future demand for EAF steel.

2:15 p.m.
Break

2:30 p.m.
Process Control Aspects for the EAF
Rob Oldroyd, Nucor Steel–Decatur LLC

3:45 p.m.
Break

4 p.m.
Practical EAF Regulation and Electrode Handling
Jackson Kuntze, Tokai Carbon GE LLC
Electrode regulation is a critical component of EAFs, controlling the conversion of electricity into heat. This session will review the electrical system feeding EAFs, the electrode regulation control loop and typical issues that impact EAF electrical operations.

Friday, 11 February 2022

7 a.m.
Breakfast

8 a.m.
Gas/Carbon Injection Systems
Mike Grant, Air Liquide Global Management Services GmbH
This lecture will present the theory, practical aspects and strategy of use of oxygen, natural gas and carbon injection in the EAF as well as the technologies used to apply these. The use of DRI, its advantages and challenges, as well as the necessary operational adjustments to DRI use will be presented. The impact EAF steelmaking on CO₂ emissions in the steel industry is discussed. A strong emphasis on oxygen safety and its precautions is presented.

9:15 a.m.
Break

9:30 a.m.
EAF Steelmaking Fundamentals
Mark Trapp, CIX Inc.

10:30 a.m.
Break

10:45 a.m.
EAF Steelmaking Fundamentals (cont'd)

Noon
Conference Adjourn