System Automation Fundamentals

in conjunction with Cold Rolling Fundamentals

— A Practical Training Seminar

10–13 September 2018

The Westin Huntsville
Huntsville, Ala., USA

Featured Plant Tour:
Nucor Steel–Decatur LLC

Registration Includes

Registration includes breakfasts and lunches Tuesday through Thursday; reception Tuesday; 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 Westin Huntsville, Huntsville, Ala., USA. Please call the hotel at +1.256.428.2000 by 20 August 2018 to secure the AIST discount rate of US$145 per night for single/double occupancy.

AIST Members		Non-Members	
US$845	US$1,060	US$945	US$1,160
by 30 July 2018	after 30 July 2018	by 30 July 2018	after 30 July 2018

Featured Plant Tour

Nucor Steel–Decatur LLC

About the Program

Few individuals are knowledgeable about the complete L0, L1 and L2 systems available today for various rolling mill types. Current sensor and control technologies coupled with modern communication architecture allow implementation of functionality without regard for the traditional level designations. Effective system maintenance typically requires system-wide knowledge and may cross organizational boundaries. This conference will provide an overview of what is available today, along with details of how individual mills may be configured. This knowledge will be useful for upgrading existing mills as well as new installations.

This conference covers various components and systems available, making organizational discussions less stressful and implementation more seamless. The agenda is a single track with time reserved for small group discussions on specific topics of interest.

Who Should Attend

These sessions will benefit newcomers and experienced individuals alike who buy or maintain L0–L2 electrical equipment and systems on any mill type.

Professional Development Hours

This course may qualify for up to 17 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 credit in New York, Florida, North Carolina and Oklahoma.

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AIST's Electrical Applications and Computer Applications Technology Committees.

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Schedule of Events

Monday, 10 September 2018

4–6 p.m.
Registration

Tuesday, 11 September 2018

7 a.m.
Registration and Breakfast

8 a.m.
Welcome, Introduction and Overview

8:10 a.m.
Fundamentals of Speed and Position Sensors
Jay Goree, Nidec Industrial Solutions
Speed and position sensors are a fundamental block in closed-loop control systems. This presentation will outline the basic operational theory, construction, application considerations and troubleshooting of sensors used for feedback of speed and position in closed-loop control applications.

8:40 a.m.
Vision Systems — Surface Inspection
Gregory Gutmann, ISRA Surface Vision Inc.
Learn about the basics of surface inspection; the differences between line scan and area scan technologies, detection, classification, and reporting of surface defects. Learn about innovations in 3D technology as it applies to slab, plate and pickled products.

9:10 a.m.
Strip Width Measurement
Brian Smith, ANDRITZ Herr-Voss Stamco Inc.
This presentation will cover the importance of strip width measurement — why it is important to the process, what it means to downstream processing and how it can affect the product outcome. Various techniques for measurement and detection in the industry will be covered, as well as how implementation and upgrade paths can alter the outcomes of the mill.

9:35 a.m.
Strip Thickness Measurement Systems
Chris Burnett, Thermo Fisher Scientific
Thickness sensors are a critical component to the modern rolling mill. Used for AGC feedback and quality assurance, proper integration of the data they provide is essential for optimizing mill productivity. A review of various sensors used will be presented.

10 a.m.
Break

10:15 a.m.
Shape Rolls and Flatness Measurement
Mark Zipf, Cold Rolling Technologies Inc.
This presentation will provide an introduction to the overall shape/flatness measurement and control problem, including specific definitions of profile, shape and flatness. An overview will be given of the distortion phenomena and its sources/formation, including an analysis of the force-loaded transverse roll stack deflection characteristics, thermal reactions and available corrective shape actuators. How to measure shape/flatness and the strategies used in contemporary systems will be covered. Discussion will include the primary components, architecture, and theory of operation of automatic shape/flatness measurement and control systems. Shape/flatness control performance characterization and specification will also be discussed.

11:00 a.m.
Strip Coating Technology
Chris Burnett, Thermo Fisher Scientific

11:30 a.m.
Sensor Roundtable Question and Answer With Sensors Subcommittee

Noon
Lunch

1 p.m.
Plant Tour of Nucor Steel–Decatur LLC

Schedule of Events (cont'd)

5 p.m.
Return From Plant Tour

5–6 p.m.
Reception

Wednesday, 12 September 2018

7 a.m.
Breakfast

8:00 a.m.
Process Models and Simulation
Mark Zipf, Cold Rolling Technologies Inc.
This presentation will provide an introduction to the concepts and strategies of mathematical modeling and simulation, focusing on understanding what models are, what simulation is, and how they are combined to provide insight into and predictions of process, machine and control system behavior. Included will be a review, classification and comparison of the different types of mathematical modeling techniques, and their applicability to certain circumstances and interests, followed by an examination of the various forms of model evaluation and system simulation. Strategies of model development are considered, along with model implementation, validation and tuning. Model/simulation capabilities, predictive accuracy/confidence and practical assessment of results are discussed.

8:45 a.m.
Level 1 Controllers — The Workhorses of Modern Control Systems
Reginald Snyder, TMEIC
Included in this discussion are a brief history and evolution of the industrial programmable logic controller (PLC), PLC applications issues from single machines to networked systems, the effects of standards for programming language (IEC 61131.3) and future possibilities — where will the control go?

9:35 a.m.
L2 Systems
Paul Jackson, TMEIC
This presentation provides an overview of the current architecture and design of L2 (supervisory) computer systems for the metals industry.

10:15 a.m.
Break

10:30 a.m.
Drives — How They Fit in the System
Ron Tessendorf, TMEIC

11:15 a.m.
Conventional Hot Mill Applications
Reginald Snyder, TMEIC
The hot rolling process of flat products is shown by presenting each of the individual sections of the rolling mill. For each of the sections, the process sensors and actuators, control functions, as well as application features, process merits and control trends are reviewed. Finally, the "global" control system applications and challenges for the future are outlined.

Noon
Lunch

1 p.m.
Process Control Signal Requirements
Bryan Beard, TMEIC
This presentation will provide an introduction to signal requirements within the automation architecture. It will further address limiting factors, transmission issues and scan times.

1:45 p.m.
Interface Considerations
Patrick Gallagher, Management Science Associates Inc.
This session provides a brief history of the evolution of how process systems connect to each other, what current techniques are being used and what trends indicate for the future.

2:30 p.m.
Computer Solutions — L1 and L2
Brian Allgaier, Automated Control Concepts Inc.
This presentation provides a technology review for L1 HMI and L2 SCADA/MES solutions. Review of hardware and software solutions in the fast-moving computer technology field.

3:15 p.m.
Break

3:30 p.m.
Operating Systems
Paul Jackson, TMEIC

4:15 p.m.
Process Condition Monitoring
Bob Miller, IVC Technologies, and Eric Snyder, IBA America LLC
This paper will provide an overview of process condition monitoring. It will cover the users of the monitored data, the types and classes of data, and various methods by which it can be acquired. More importantly, discussion will focus on turning data into information and providing real-world examples as they pertain to the metals industry.

Schedule of Events (cont'd)

Thursday, 13 September 2018

7 a.m.
Breakfast

8 a.m.
Process Line Topologies
Ron Tessendorf, TMEIC

9 a.m.
Production, Planning and Scheduling in Steel
Perry Zalevsky, OSIsoft LLC
All steel mills must plan and schedule the work to be done considering customer requirements, equipment availability and a number of other factors. This talk will present an overview of the problem and some examples of how steel companies are effectively planning and scheduling production through the mill.

10 a.m.
Break

10:15 a.m.
Digitalization of the Steel Industry Introduction
Chris Burnett, Thermo Fisher Scientific

10:30 a.m.
Digitalization of the Steel Industry Roundtable Discussion

Noon
Lunch

1 p.m.
Continuous Caster Process Systems
Thomas Carr, Primetals Technologies USA LLC
This session provides an overview of modern process systems for continuous casters. Specific topics include process equipment, level 1 controls, level 2 functions, process models and technological packages that constitute a modern, hierarchical caster process system.

1:45 p.m.
Reheat Furnace Process Optimization
Robert Robison, Primetals Technologies USA LLC

2:30 p.m.
Break

2:45 p.m.
Project Management Roundtable Discussion on Upgrade Projects

5 p.m.
Conference Adjourn