



CONTINUOUS CASTING

— A PRACTICAL TRAINING SEMINAR

15-17 OCTOBER 2013 | DOUBLETREE BY HILTON MEMPHIS DOWNTOWN, MEMPHIS, TENN., USA

MONDAY
14 OCTOBER 2013

4 p.m.
Registration

TUESDAY
15 OCTOBER 2013

7 a.m.
Registration and Continental Breakfast

8 a.m.
**HISTORICAL PERSPECTIVE AND STRAND
SOLIDIFICATION**

Jack Young, Hatch Ltd.

The basics of strand solidification will be discussed, including the impact of caster design on solidification and variables that impact quality.

9 a.m.
**CONTINUOUS CASTER DESIGN AND
TECHNOLOGY (SLAB AND LONG PRODUCTS)**

Phil Ponikvar, Consultant

How a continuous casting machine is designed is based on production, quality and safety requirements as stipulated by the customer. Needs of the customer impact the selection of mechanical equipment. The level of automation and implementation of the technological package for billet, bloom, round, beam blank and slab casting machines will be discussed.

9:45 a.m.
Break

10 a.m.

**AN OPERATOR'S GUIDE TO CONTINUOUS CASTING
FLUX: WHAT IT IS, WHAT IT DOES AND HOW IT IS
USED**

Darrell Sturgill and Marc McClymonds, Stollberg Inc.

Mold flux design, along with its reaction with steel inclusions, will be discussed. Operator's involvement related to start casts, consistent mold flux application and end-of-casting practices will be discussed.

11 a.m.

**INITIAL SOLIDIFICATION AND OSCILLATION MARK
FORMATION**

Brian G. Thomas, University of Illinois at Urbana-Champaign

Initial solidification at the meniscus is critical to the surface of continuously cast steel. The phenomena that govern initial solidification are explained, with emphasis on how surface quality problems arise. Each mold oscillation cycle generates a periodic transverse depression called an "oscillation mark," and sometimes also a subsurface microstructural feature called a "hook." These features usually form due to meniscus overflow and depend on the alloy composition, superheat, fluid flow and level fluctuations, heat transfer to the mold walls, slag properties, and oscillation practice.

Noon
Lunch

1 p.m.

**CASTER SECONDARY COOLING AND WATER
TREATMENT**

Eric Rosenow, Nalco Co., and Steve Swoope, Delavan Spray Technologies

The authors will review the water treatment-related challenges and needs in continuous caster secondary cooling systems and the potential impacts that secondary water quality can have on the operational and maintenance aspects of a caster.

1:45 p.m.

SOURCES OF REOXIDATION AND WHY TO AVOID

Ron O'Malley, Nucor Steel-Decatur LLC

To produce high-quality cast products, steel must be protected from reoxidation. Reoxidation can occur in the ladle, at secondary ladle metallurgy operation, and also in the transfer operations from ladle to tundish and tundish to the mold. Various techniques are described that can be used to minimize reoxidation.

2:45 p.m.

Break

3 p.m.

CASTER BREAKOUTS AND THEIR PREVENTION

William Emling, SMS Siemag LLC

A review of the causes and prevention of breakouts, citing information contained in *The Making Shaping and Treating of Steel*[®], 11th edition, Casting Volume.

3:45 p.m.

CASTER QUALITY DEFECTS AND THEIR POTENTIAL CAUSES

Ron O'Malley, Nucor Steel-Decatur LLC

The surface and internal quality of continuously cast slabs and billets is intimately linked to the caster design and to the operating and maintenance practices employed in the continuous casting process. Common causes for five classes of continuous casting defects (longitudinal cracking, transverse cracking, slivers and lamination defects, internal cracking, and segregation defects) will be reviewed and linked to these design and practice influences.

WEDNESDAY
16 OCTOBER 2013

7 a.m.

Continental Breakfast

8 a.m.

MOLD DESIGN, MATERIALS AND FAILURE MECHANISMS

Ian Bakshi, KME America Inc.

This presentation includes: an overview of the types of molds in use, properties of commonly used mold materials and their advantages and disadvantages, operational factors affecting mold performance, and typical mold failure mechanisms.

9 a.m.

MOLD AND COPPER MAINTENANCE AND COATING TECHNOLOGIES

Chad Donovan, SMS Millcraft

The author will discuss the history of and reasons for coating continuous caster molds. Various options and operating conditions to consider when choosing a mold coating will also be presented.

10 a.m.

Break

10:15 a.m.

CASTER ROLL MAINTENANCE AND OVERLAY TECHNOLOGIES

Jeff Brower, Siemens Industry Inc.

This session will focus on the design variations of rolls, as well as the influences of component maintenance and proper alignment. Additionally, roll life can be significantly increased through the use of engineered overlays and base materials. By targeting roll erosion, corrosion, wear and thermal fatigue, this session will detail the

variations of overlay materials, process controls and new roll technologies developed for all types of continuous casting machines.

11:15 a.m.

CASTER BEARINGS — TYPES OR BEARINGS, FAILURE MODES AND PREVENTIVE MAINTENANCE

Warren Doerner, SKF USA Inc.

This presentation includes: an overview of the types of molds in use, properties of commonly used mold materials and their advantages and disadvantages, operational factors affecting mold performance, and typical mold failure mechanisms.

Noon

Lunch

1 p.m.

CASTER HYDRAULICS — FAILURE MODES AND PREVENTIVE MAINTENANCE

Mark Cook, Yates Industries Inc.

The author will review the types and styles of cylinders, cylinder failures, preventive maintenance and an effective cylinder recognition program.

1:45 p.m.

CRITICAL MAINTENANCE ISSUES FOR BILLETS AND BLOOMS

Bill Schlichting, U. S. Steel – Gary Works

This presentation describes practical experience with casting of blooms and billets in regard to maintenance issues.

2:30 p.m.

Break

2:45 p.m.

OPERATOR'S PERSPECTIVE ROUNDTABLE

Ron O'Malley, Nucor Steel-Decatur LLC; Bill Schlichting, U. S. Steel – Gary Works; Rick Besich, ArcelorMittal Indiana Harbor; Ian Deeks, Nucor Steel-South Carolina; and moderator, Jeff Brower, Siemens Industry Inc.

4 p.m.

Reception



THURSDAY
17 OCTOBER 2013

7 a.m.

Continental Breakfast

8 a.m.

PLANT TOUR OF NUCOR STEEL MEMPHIS INC.

Noon

Return From Plant Tour and Adjourn

