Student-Based Research Project to Foster Occupational Safety Career Pathways for the Steel and Other Industries

Hazards are ever-present in the steel plant environment, and a heightened awareness and emphasis on safety is a necessary priority for our industry. This monthly column, coordinated by members of the AIST Safety & Health Technology Committee, focuses on procedures and practices to promote a safe working environment for everyone.

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Comments are welcome. If you have questions about this topic or other safety issues, please contact safetyfirst@aist.org. Please include your full name, company name, mailing address and email in all correspondence.

Don B. Daily Memorial Fund
To Promote Steel Industry Safety and Health

This article is the second in a series of Safety First articles featuring the reports from the recipients of the 2013 Don B. Daily Memorial Fund. The first article in the series was published in the August 2014 issue of *Iron & Steel Technology.*

Background

Republic Steel is committed to providing its customers with hot rolled and cold finished steel bars, coils, and cast products for demanding forging steel applications that are delivered on time, meeting quality expectations that provide real value.

When manufacturing its special bar quality (SBQ) products, Republic strives to control the environmental impacts resulting from its operations, and to ensure the health and safety of its employees and those working at the plant on Republic's behalf.

Republic's environmental, health and safety management system is committed to the prevention of pollution, injuries and illness while continually improving system management and performance.

Republic complies with applicable requirements that relate to both the environmental aspects and workplace hazards of its business.

Through ISO 14001 and OHSAS 18001, Republic's environmental, health and safety management system is structured on training, communication, employee participation, document control, objective and target setting, and management's periodic reviews to ensure environmental protection and a safe and clean workplace.

Problem Statement

The first step in identifying the specific scope of this project included research of the process itself and identification of potential hazards.

The production of steel at Republic Steel can be followed in eight steps:

1. Scrap charging of the electric arc furnace (EAF).
2. Melting.
3. Metallurgical refining at the ladle refining furnace.
4. Deslagging.
5. Tapping.
6. Furnace turnaround.
7. Vacuum degassing.
8. Casting.

Each phase of the steel refining process requires unique safety measures for the equipment being used.

During the lockout/tagout process of each production phase, there are usually two employees

Figure 1

Molten steel entering the billet caster.

Figure 2

Runout rolls designed for cooling.

designated to cross-check the safety hazards, personal protective equipment (PPE), and tools necessary to lock the machines properly and prevent bodily harm or injury.

In the past, industrial workers became complacent in the safety routine, and may have overlooked critical precautions that are imperative to keep the workplace free from injury. Thus, additional safety measures have been created by the authors, including a checklist that will keep old systems fresh, break old habits, and model acceptable safety standards.

Proposed Solution

Republic Steel has previously had to address some issues that had been identified by the U.S. Occupational Safety and Health Administration (OSHA), and the authors believe that a safety checklist will help to make the plant a safer workplace.

The checklist includes all of the PPE, tools and safety precautions that a Republic employee will need before locking out a machine. After the checklist is complete, the employee will sign his or her name, along with the date and time. This will ensure that no employee overlooks any major safety components and that all machinery is locked out in the safest manner possible.

To develop the proposed checklist (Appendix A, on the next page), it was decided to focus on the runout rolls in the last phase of steel bar production. The list is a template that can be customized for each stage of production.

Implementation of this new strategy should include revising the lockout/tagout packet given by the shift foreman, who will also check the list to ensure that each employee on that station has signed off on tasks completed.

Not only will the new checklist assist Republic Steel in remaining compliant with industry safety standards set forth by OSHA, but it will also save the industry lost time and costs incurred by excess personnel wages and potential fines for safety violations.

Conclusion

The research team at Lorain County Community College, in conjunction with Republic Steel, is hopeful that implementation of these quality controls will be widely accepted and utilized across the industry to make steel production safer. ✦

Appendix A

Republic Steel Lockout/Tagout
Safety Checklist
Runout Rolls

Tools

	Flashlight
	Radio
	Spray paint
	Ladder
	Wrench
	SPZ all-purpose grease gun
	Urea electric motor grease gun

Safety and PPE

	Gloves
	Metatarsal shoes
	Flame-retardant clothing
	Hard hat
	Side shield safety glasses
	Ear protection
	Your lock and tag
	Lockout box if needed
	Be with at least one other person
	Notify operator before locking out
	Try out

Parts

	40 60 weight oil
	SPZ all-purpose grease
	Urea electric motor grease
	Chain lube oil

Safety Hazards

	Look for cracks in stairs
	Look for holes in grating
	Watch for cranes
	Look for sharp edges
	Be aware of slippery surfaces
	Look for rust
	Avoid arc flash

Signature

Date and Time

Safety checklist.