

Preventing Hand Injuries in the Steel Industry Through Assessment, Awareness and Training

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.



This article is the fourth in a series of Safety First articles featuring the reports from the recipients of the 2012 Don B. Daily Memorial Fund. The first article in the series can be found in the October 2013 issue of *Iron & Steel Technology*, the second article in the November 2013 issue, and the third in the December 2013 issue.

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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.

An interdisciplinary team of graduate students from Auburn University and the University of Alabama at Birmingham investigated hand injuries at CMC Steel Alabama, Birmingham, Ala. The team consisted of students in occupational health nursing, industrial and systems engineering, and industrial hygiene. CMC safety manager Michele Dykes provided tremendous support through this process.

Before their initial site visit to CMC Steel, the team members met to get to know each other and outline the team's collective strengths and weaknesses in safety and health. Several members of the team have full-time jobs and are completing their graduate degrees through online courses; others are full-time students taking traditional courses at either Auburn University or University of Alabama at Birmingham.

The team's strengths include skills in Web-based research, video editing and production, communication and the use of various communication tools. The team identified "lack of experience dealing specifically with the

steel industry" as its primary weakness. After this team assessment phase, the students were required to complete a literature review on the steel industry and steelmaking process, as well as training to prevent hand injuries.

During the initial site visit and time spent with Ms. Dykes, the team developed a more comprehensive understanding of the steel mill production process, specifically the rolling mill. The team developed a strategy for involving CMC Steel Alabama team members in preventing hand injuries. The steps included:

- A computer-based training with pre- and post-surveys on knowledge of hand injury prevention.
- Training was developed specifically for employees in the rolling mill, based on the results of the pre-survey.
- All rolling mill employees (54 employees) have completed the training.
- Highly visible gloves were selected and distributed to rolling mill employees.

Figure 1

- Flyers on hand injury prevention at home were developed and mailed to all CMC employees (Figure 1).
- Posters, which featured CMC employees, were developed and displayed throughout the CMC Steel Alabama facility.

In April 2013, the team presented the results of its experiences at CMC Steel Alabama to university faculty, health and safety practitioners, and their peers at the University of Alabama at Birmingham and Auburn University. With the semester ending and some members of the team graduating, Lori Rotton and Megan Moore continued to provide input for completion of the project. The team gained a greater appreciation of the steel industry and a much greater gratitude for the men and women in steel manufacturing.

The feedback from CMC Steel Alabama has been very positive, thanks to the significant employee engagement in the project. A hand injury, whether it occurs on or off the job, can be very expensive, with direct and indirect costs reaching into the thousands. As with any injury, hand injuries may have a significant impact on the health and well-being of the injured person. CMC

HIP² for CMC Team Members and Their Families

WHY ARE YOUR HANDS IMPORTANT?

- ◆ Human hands are unique. No other creature can grasp, hold, move and manipulate objects like a human can.
- ◆ The hand is one of the most complex parts of your body — the coordination between tendon, bones, tissues and nerves allows you to grip and do a variety of complex tasks.

HAND INJURIES CAN OCCUR ON THE JOB AND OFF THE JOB!

Here are a few tips to prevent hand injuries in your home:

- ◆ Keep your eyes on what you are doing, especially when using power tools.
- ◆ If it is necessary to work in a vision-occluded area, use extreme caution.
- ◆ Do not push garbage down a disposal with your fingers while the motor is on.
- ◆ Read instructions before using hand tools or small appliances.
- ◆ Slow down. Remember, many injuries are caused by rushing. Speed may decrease accuracy and control.
- ◆ Use proper tools designed for a specific task.
- ◆ Do not remove guards of safety devices from equipment such as circular saws.
- ◆ Turn off lawnmowers and power cutting tools before putting hands in the vicinity of the blade(s) or emptying.

HIP² is the Hand Injury Prevention Program for CMC Steel Alabama employees made possible by the Don B. Daily Memorial Fund to Promote Steel Industry Safety & Health, the Steel Manufacturers Association, the AIST Foundation, your CMC Steel Safety Team and the Deep South Center for Occupational Health and Safety at the University of Alabama Birmingham and Auburn University.

It is HIP² be safe at home, work and play!

A flyer about hand injury prevention was created by the project team.

Steel Alabama has reported a reduction in hand injuries since the training was implemented. ◆

Did You Know?

SMDI: Lightweight Steel Twist Beam Achieves 30% Mass Reduction

Furthering its mission to help automakers meet stringent fuel economy requirements, the Steel Market Development Institute's (SMDI) Automotive Applications Council unveiled the results of its lightweight steel twist beam study.

The project resulted in a 30% mass reduction at a significantly lower cost compared to designs using alternative materials. SMDI is a business unit of the American Iron and Steel Institute.

"With fuel economy regulations increasing rapidly, automakers are looking for every way they can to take weight out of vehicles," said Ronald Krupitzer, vice president, automotive market, SMDI. "The lightweight steel twist beam project is a great example of how currently available advanced steel technologies enable aggressive weight savings in the vehicle's suspension, thus enabling better fuel economy for the automaker and the consumer."

The results of the study indicated that the selected "U-Beam" design — based on a tubular shape using advanced steels — achieves a 30% mass reduction relative to the baseline assembly, at a modest 15% cost increase, considerably less than the cost of similar weight savings from materials like aluminum.

The original objective of the project was to develop a lightweight steel twist beam that achieved 15–25% mass reduction, with equivalent performance to the baseline design and a lower or equivalent cost to alternative materials. A twist beam assembly in commercial use today was selected for the baseline packaging, performance, mass and cost.

Funded by members of SMDI's Automotive Applications Council and members of Chrysler Group LLC, Ford Motor Co. and General Motors Co., the lightweight twist beam project was conducted by Ont., Canada-based Multimatic Inc. For a copy of the final report and executive summary, visit www.autosteel.org.