

# Strategically Reduce Hand Injuries Using the Hierarchy of Hazard Control

In 2012, a steelworker in the United States sustained a laceration on his hand, which subsequently led to a fall and a head injury, ultimately resulting in his death. The average manufacturing employee often fails to recognize the potential severity of hand injuries, which can lead to a lack of “buy-in” to workplace safety practices. Employees do not always appreciate how quickly these injuries occur and how life-altering they can be. The key to a safer, more efficient and more cost-effective workplace is eliminating the hazards altogether, including engineered solutions. When a hazard cannot be eliminated, steps must be taken to improve safety training and personal protective equipment (PPE).

In Canada, more than 500,000 hand injuries<sup>1</sup> occur in the workplace each year. Approximately one-third of these preventable injuries are serious enough to become a “days away from work” case.

Common types of hand injuries in the workplace include:

- Laceration/abrasion/puncture.
- Crush.
- Foreign body.
- Avulsion/degloving.
- Strain/sprain.
- Burn/frostbite.
- Fracture/break/dislocation.

In 2010, United States Steel Corporation began a reflective and investigative process regarding hand safety. This investigation revealed that, although overall injury numbers were

declining, hand injuries were on the rise. Furthermore, it identified that several factors contribute to an increased risk of hand injuries, including: lack of awareness, lack of education, not wearing required PPE and complacency. In response to these findings, U. S. Steel devised a number of strategies under the following hazard-elimination industry-recognized categories: Elimination, Substitution, Engineering Controls, Administrative Controls and Personal Protective Equipment.

## 1. Elimination – Avoiding the Hazard or Risk Before It Occurs

U. S. Steel introduced a company-wide Hazard Identification and Risk Assessment Program beginning in 2012. Following specific training in hazard identification, each manager/supervisor is tasked to proactively identify, prioritize and eliminate hazards in his/her area. This is achieved by incorporating new engineered solutions and re-evaluating the Safe Job Procedures, a document that describes the details and potential hazards of a task. To encourage buy-in and widespread implementation, a range of incentive programs have been developed to increase safety awareness and recognition. For example, the Chairman’s Safety Excellence Award is presented to the plant with the best safety record and the greatest number of completed Hazard Elimination Projects. As a result, U. S. Steel as a

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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whole completed 8,685 projects in 2012, effectively eliminating areas of medium to high risk.

## 2. Substitution — Upgrading Outdated Equipment

U. S. Steel has also found opportunities to replace older, heavier and less ergonomically designed equipment with newer, ergonomically correct models. For example, heavy crimpers used for banding steel coils are being updated to a lighter, powered, cordless model. This reduces repetitive strain injuries in addition to eliminating an air-hose tripping hazard. Another example is the substitution of open blade knives with rounded-end box cutters that do not directly expose employees' hands to the blade.

## 3. Engineering Controls — Re-Engineering Older Equipment

Ensuring that equipment is properly identified and guarded is an important method of keeping hands away from danger zones. One example would be the installation of two-handed safety control interlocks and light curtains to stop equipment from running when hands are in a danger zone. Every day, new tools are being engineered with employee input to promote correct posture and healthy movement while performing tasks. These efforts are critical to preventing repetitive motion injuries and reducing the need for employees to do "restricted work."

## 4. Administrative Controls — Revising Training and Policies

Part of an effective plan is ensuring that all policies, safety conversation procedures, and training programs have been updated to specifically place an emphasis on hand safety. Three policies specific to hand safety are used as part of the U. S. Steel safety training program, including:

- No-Touch Tool policy.
- No Jewelry policy.
- 100% Glove policy (U. S. Steel Canada only).

These policies help promote a positive safety culture in which employees are encouraged to be more aware of workplace hazards and how to protect themselves. To further emphasize this point, employees are asked to simulate how a hand

injury could profoundly impact their lives. As part of this exercise, employees are asked to attempt to perform a variety of tasks without the use of their fingers and/or hands. In addition, injured workers are invited to visit U. S. Steel plants across North America to explain how their hand injuries changed their lives. These stories personalize the experience and emphasize that hand injuries can easily happen to anyone if proper care is not taken. Finally, regular safety conversations between supervisors and employees are an effective way to remind each other to stay focused on doing their respective jobs safely.

## 5. Personal Protective Equipment — The Last Line of Defense

**Gloves** — Employees often start a task without putting on their gloves because they fail to recognize that gloves make a marked difference in hand safety. A Liberty Mutual study<sup>2</sup> has demonstrated that at least 60% of hand injuries are caused by not wearing gloves or by wearing the wrong gloves for the task.

During incident investigations, employees sometimes stated that they could not properly perform a particular job with the glove options they had available. Most frequently, employees complained

Figure 1



Cut- and puncture-resistant rigger's glove.

that the gloves did not provide the dexterity they needed to do the task. The resulting reluctance to wear gloves greatly increases the potential for hand injury. In each of these cases where employees are reluctant to wear gloves, U. S. Steel has conducted research to find a better-suited glove for the task. Innovative glove technology offers products with increased protection, comfort, breathability and dexterity. In addition, employees are given greater access to PPE through the use of new on-site PPE cabinets or vending machines. Glove clips are also provided to allow employees to carry more than one pair with them in case the type of work changes.

**No-Touch Tools** — Most hand injuries involving pinch points can be eliminated by using no-touch tools. U. S. Steel continues to design no-touch tools in many shapes and sizes and provide hands-on training to demonstrate the ease of use of no-touch tools as well as promote their use.

U. S. Steel believes that all incidents and injuries can be prevented. Safety is a personal responsibility of all employees, and management is accountable for

Figure 2



A no-touch tool should be used to hold a chisel or punch, to keep hands and fingers out of the impact zone.

results. Eliminating hazards before an injury occurs is key to attaining the goal of zero injuries. The use of appropriate gloves and training is also essential. Companies can promote buy-in from employees, achieve success and improve safety collaboratively by valuing workers' feedback.

**References**

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2. T. Christensen and T. Braun, "Preventing Hand Injuries in Construction," *Construction Executive*, July 2006, pp. 40-41. ♦

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