

Fatalities Involving Mobile Equipment: Had Enough Yet?

Too many fatalities occur in the primary metals industry. According to the U.S. Bureau of Labor Statistics, the number of fatalities per 100,000 workers has averaged 4.9 over the last 10 years, which is more than twice the fatality rate of manufacturing in general. More specifically, well over 50% of those fatalities are associated with heavy mobile equipment.

The equipment involved in these fatalities are slab and pipe carriers, slag pot carriers, front-end loaders, forklifts, bulldozers, haul trucks, coil carriers and others. Common features on this equipment are that they are large, need some distance to stop and generally have reduced operator visibility. Since most primary metal mobile equipment operates in tight quarters, there is little room for error.

Most of the fatalities involve an employee who, for any number of reasons, gets in the way of one of these pieces of equipment, and the operators either do not know he/she is there or cannot stop in time. A simple (and often used) preventive solution is to tell employees to “be more careful” and “stay away from this equipment while it is moving.” Unfortunately, this simply does not always work, as human motivation factors of seeking time and comfort often override situational awareness. The hazard of mobile equipment interfacing with a person cannot be avoided by an administrative order to simply stay away, stay clear or be more aware. As with any other safety hazard, more effective measures must be taken.

- **Hazard Elimination** — This is the best (and usually the hardest and most expensive) way to deal with the hazard: simply

make it go away. An example is replacing work done by mobile equipment with fixed equipment to move the same material (being careful to design with hazard control in mind; otherwise, other hazards may be created). Moving material from one location to the other via a fixed conveyor rather than mobile equipment is often safer, but may not be the most efficient or cost-effective. However, it is recognized that in the correct application, it may be possible. If hazards cannot be eliminated, then they must be controlled.

- **Hazard Control** — There are several ideas in practice which can help to control the hazards. They include barriers, technology, warnings and alarms.

Barriers, such as dedicated roadways intended for only the mobile equipment to travel, go a long way in controlling the hazard. Keeping people physically separated from the hazard of mobile equipment is a positive and effective means of protection. The downside of dedicated roadways is that often people will ignore, or will fail to recognize, that the roadway is indeed dedicated, thereby making the mistake of using it for travel. Thus, the unsuspecting equipment operator is unaware of their presence until it is too late.

For walkways, there should be physical barriers erected so the mobile equipment and pedestrians cannot physically interface. This can sometimes be as simple as an engineered concrete highway barrier or even a solid berm of secondary products (i.e., slag). However, even with barriers, there are times

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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people must interface with mobile equipment, and this is when technology, warnings and alarms come into play.

This technology comes in many different forms. First, there are the advances made in cameras, which include visual, infrared and in-cab types. Visual cameras are the kind people are most accustomed to using. This involves mounting sturdy and protected cameras on the outside of equipment in strategic locations where blind spots are located. Strategically placing a high-quality camera can virtually eliminate a blind spot from an operator's point of vision. Infrared cameras are used in areas of reduced visibility caused by fog or steam. These cameras can virtually see through an impairment, identifying the heat emitted by humans and other running equipment, thus alerting the operator to an unsuspected presence. Finally, there is the in-cab camera. This camera views and records both the operator's motions as well as the location in which the equipment is being operated. This is least favored by the equipment operator, but when used for training purposes, it can identify near-misses and close encounters, which can be fixed before a serious incident occurs. Cameras continue to decrease in price and increase in flexibility, and when strategically used, they can have an immediate impact of reducing hazards.

In addition to cameras, the latest technology being advanced is radio proximity detection. When used properly, it can alert an equipment operator that a person is within proximity of the location. This technology is similar to that which is used at retail stores: the items for purchase are affixed with a microchip and a scanner is located at the exit,

which sounds an alarm if the microchip passes through the scanner without being deactivated. In the safety scenario, the chip is affixed to a person's hard hat or safety vest, and the reader is located on the equipment. The system is able to be programmed to read a chip from a close or long distance, whereby a "safety zone" can be established around the mobile equipment.

Finally, there is the issue of illumination. Having good lighting on mobile equipment is a critical issue, as even with the best camera systems, the operator cannot always look and see a person in the shadows.

Always a great addition to any safety process are items such as:

- Signs strategically placed as visual reminders of existing hazards.
- Daily toolbox safety talks to discuss the type and scope of mobile equipment running in the area.
- Excellent mobile equipment operator training, resulting in the best trained operator in the seat.

In conclusion, there have been significant advances made in the safety and health processes at many primary steel industry facilities. However, fatality statistics indicate that efforts toward working safely around heavy mobile equipment must be redoubled. As an industry, tolerance of these tragic incidents must be lowered, and ways toward eliminating or controlling them must be managed. When it comes to the continuing fatalities involving mobile equipment, now is the time when one must ask, "Had enough yet?"



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