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Of Transportation

**Federal Railroad
Administration**

Research Results

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An Examination of Railroad Yard Worker Safety

SUMMARY

To assist the U.S. railroad industry in its efforts to improve safety, the Federal Railroad Administration (FRA) Office of Research and Development's Human Factors Program sponsored an exploratory study into causes and contributors to railroad yard injuries and human factor-attributed train accidents. Part of this research involved analyses of large FRA-maintained databases of injury and accident data, while another part involved structured interviews with rail management and focus groups with rail labor. Based on the findings from the large database analyses and structured interviews and focus groups with rail management and labor, a number of recommendations were made to increase safety in railroad yards. Recommendations focused on activities that both the railroad industry and the FRA can do to achieve a safer workplace.



Figure 1: Example of a flat switching railroad yard operation



BACKGROUND

Safety in the U.S. railroad industry has improved markedly over the last two decades. However, the number of injuries and accidents in railroad yards far exceed the number of injuries and accidents in other parts of the railroad. Almost half of all train accidents and almost a third of all railroad employee injuries occurred in railroad yards in 1998 [1]. Understanding the circumstances and characteristics of these accidents and injuries is a prerequisite to reducing workplace hazards and dangerous work practices. Continued improvements in railroad safety will not only reduce the number and severity of injuries, but also should result in significant savings for the railroads. According to the Transportation Research Board [2], job-related injuries cost American railroads over \$1 billion annually. To assist the U.S. railroad industry in its efforts to improve safety in the workplace, the Federal Railroad Administration (FRA) initiated research to examine worker safety issues in railroad yards.

Research Objectives

The research program focused on human factor-related hazards and solutions. Objectives of the program were to:

- Identify injury and accident trends using the FRA accident and injury databases.
- Examine the effect of work schedule on yard injuries.
- Solicit and evaluate railroad labor and management opinions and experiences regarding safety in yards.
- Explore methods for collecting additional injury causal factor data.

Methods

The research effort involved 1) analyses of FRA-maintained railroad injury and accident data, 2) analysis of site-specific injury and work schedule data from a participating railroad, 3) structured interviews with railroad management, and 4) focus groups with railroad labor. The structured interviews and focus groups provided an understanding of the safety issues that could not be gleaned from analyses of existing FRA databases and personal injury and work schedule data from the participating railroad.

CONCLUSIONS

Analyses of railroad yard worker injury data revealed that eighty percent of injuries resulted in one or more lost workdays (a lost workday is either a day completely absent from work or a day of restricted duty); sprains and strains accounted for more than half of the injuries; the trunk/torso was the most affected body part; slips, trips and falls were the most common triggering event; and the acts of walking, running, or stepping over were the leading physical acts associated with these injuries. Most lost workday injuries occurred between 10 a.m. and 12 p.m.

Analyses of human factor-attributed train accidents in railroad yards revealed that more accidents occurred during colder and hotter temperatures than during the milder temperatures; most accidents occurred between 2 a.m. and 4 a.m. and between 4 p.m. and 6 p.m.; most accident occurred between the first and fifth hours on-duty; and only a small portion of these accidents resulted in a release of hazardous material.

Structured interviews conducted with railroad officials responsible for the development, implementation, and/or oversight of safety programs identified a number of strategies that foster worker safety in yards. These strategies centered around improved training and communications, better equipment and facilities, and enhanced employee performance.

Focus group interviews with railroad yard workers provided additional information and insight into how safety can be improved in railroad yards. For example, participants noted that material incentives play little, if any, role in encouraging safe work practices. Instead, they are seen as a subtle form of intimidation. With respect to training, carmen were generally satisfied with their training, which includes a three-year apprenticeship, while many of the trainmen and engineers, especially the newer ones, felt ill-prepared to do the job. On-the-job training was considered absolutely critical to trainmen and engineer training, and a number of factors were identified as affecting this training. They include the mentor's willingness and interest to train the new employee; an opportunity for the trainee to ask questions of the mentor; the use of checklists and other aids to help structure the on-the-job training; and an opportunity for the trainee to work with a variety of mentors. Perhaps of most significance, rail labor painted a generally adversarial picture of the safety climate in the rail industry. They felt



that harassment and intimidation were commonplace, and were used to pressure employees to not report an injury, to cut corners, and to work faster. According to participants, the result is that train crews look out for each other. Despite this perception of an adversarial relationship, labor noted several significant improvements in safety over the last 15 years, including the introduction of daily job safety briefings, and better lighting in some yards.

For Further Research

The findings from this study suggest several ways in which both the railroad industry and the FRA can improve railroad yard worker safety. A set of best practices for the railroad industry to further reduce the risk of worker injuries was identified; some of these recommendations include:

- Remove trash, debris, and other slip and trip hazards from the yard on a regular and frequent basis.
- Spend money on capital safety improvements rather than on material incentives.

Separately, some of the recommendations to the FRA to enhance its' accident and injury data collection and reporting process include:

- Collect data on injury severity.
- Develop and collect better railroad yard injury and accident exposure measures.
- Develop better and more complete instructions, definitions and guidelines to assist railroad personnel in completing FRA accident and injury forms.

Lastly, a partial listing of recommended areas of future research include:

- Examine the feasibility of developing a third-party anonymous safety reporting system.
- Conduct a root cause and error analysis of railroad yard injuries.

WANT MORE INFORMATION?

Additional analyses of yard worker safety can be found in the following FRA report:

Reinach, S., and Gertler, J. "An Examination of Railroad Yard Worker Safety." Final Report, July, 2001. Report No. DOT/FRA/ORD-01-20.

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REFERENCES

- [1] U.S. Department of Transportation, Federal Railroad Administration. (1999). *Railroad Safety Statistics Annual Report 1998*. Washington, DC: Author.
- [2] Transportation Research Board. (1994). *Compensating Injured Railroad Workers Under the Federal Employers' Liability Act*. Washington DC: National Academy Press.

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