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The Impact of Safety Rules Revisions on Safety Culture, Incident Rates, and Liability Claims in the U.S. Railroad Industry: A Summary of Lessons-learned

SUMMARY

The Federal Railroad Administration (FRA) Human Factors Research and Development (R&D) Program sponsored a lessons-learned study to examine the impact of safety rules revision on safety culture, incident rates, and liability claims in the railroad industry. Safety rules revision (or rules consolidation) identifies key rules that are universally enforceable and eliminates unnecessary and conflicting rules. The process also seeks to promote improvements in safety culture through labor-management collaboration in the rule revision. Thus, it involves a shift in primary responsibility for rules creation from management to front-line workers with management in a support role.

In this study, researchers reviewed relevant literature, interviewed key participants (management and labor) from transportation carriers that had undertaken safety rules revision, and analyzed relevant incident and injury data. Table 1 summarizes the resulting reduction in the number of safety rules at four transportation carriers. The impact of rules consolidation on other outcomes, however, is more important than mere reduction in the volume of rules. Although outcome data were statistically inconclusive, a number of other indicators in this study suggested a positive benefit on carriers that used the process. Interviewees reported more enforceable safety rules, increased compliance, and overall improvements in several aspects of safety culture, including labor-management relations and safety culture. Moreover, two carriers reported significant reductions in the number of liability claims related to the Federal Employer's Liability Act (FELA) and the cost per claim. This paper examines other potential benefits, challenges, and successful implementation strategies, as well as future directions and activities.

Table 1. Estimated reductions in the number of safety rules

<i>Company</i>	<i>Before Revision</i>	<i>After Revision</i>
American Commercial Barge Lines (ACBL)	<ul style="list-style-type: none"> 400 safety rules, policy, job aids, training information (some craft specific and some for general use) 	<ul style="list-style-type: none"> 125 core and job specific safety rules and recommended safe work practices
CSX Transportation (CSXT)	<ul style="list-style-type: none"> 900 safety rules, policy, job aids, training information (some craft specific and some for general use) 	<ul style="list-style-type: none"> 222 core and craft specific safety rules
Kansas City Southern (KCS)	<ul style="list-style-type: none"> 742 safety rules, policy, job aids, training information (some craft specific and some for general use) 	<ul style="list-style-type: none"> 678 core and craft specific safety rules (includes 98 for Clerical - no previous book)
Canadian National / Illinois Central (CN/IC)	<ul style="list-style-type: none"> 1,360 safety rules, policy, job aids, training information (some craft specific and some for general use) 	<ul style="list-style-type: none"> 686 core and craft specific safety rules

BACKGROUND

Several pressures in the railroad industry have caused a proliferation of safety rules. First, when employee behavior, not governed by an existing rule, leads to an injury, management often reacts by writing a new rule to prevent similar injuries. Second, FELA, the Federal law that governs the handling of railroad worker injury compensation, requires plaintiffs to show employer fault to receive compensation. Some argue that rules proliferate in order to limit carrier liability. Third, railroad mergers during the 1980s and 1990s resulted in the combination of hundreds of overlapping, and sometimes conflicting, safety rules. Consequently, railroad management developed increasingly specific and numerous safety rules, which labor contends led to confusion and the use of rulebooks as punitive tools for management.

Safety rules are central to the safety culture in railroads. A growing body of research suggests that safety culture is a significant driver of variations in workplace safety outcomes. In 1993, the Advisory Committee on the Safety of Nuclear Installations Human Factors Study Group provided the following definition: “The safety culture of an organization is the product of individual and group values, attitudes, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization’s health and safety programmes.” One purpose of safety rules revision is to change the culture by changing the way people value safety rules and the pattern of rule use. Organizations in a number of industries have undertaken ongoing reforms aimed at leveraging improvements in safety culture to reduce occupational injuries and deaths.

The theory of change in safety rules revision suggests that fewer, more carefully crafted, rules reduces confusion about the scope and application of rules. Proponents claim that the process builds trust between labor and management through broad workforce participation in the writing of rules, and improves compliance because of increased workforce ownership of the new rules. Thus, the theory suggests that rules consolidation will lead to fewer injuries and improvements in safety culture. This might also reduce carrier liability by clarifying which rules are applicable 100 percent of time. The cost of injuries in the

railroad industry is substantial. For example, annual expenses for one railroad’s personal injury-related events were over \$200 million in the year 2000 (Burlington Northern Santa Fe 2001 Third Quarter Filing: Securities and Exchange Commission). If the theory of change holds true, the benefits provided by safety rules revision could lead to a significant reduction in injury-related costs, resulting in a significant financial boost to the industry.

Research Objectives

The primary objectives of this study were to examine the impact of safety rules revision on safety culture, incident rates, and liability claims in the railroad industry. Secondary objectives were to understand implementation issues and challenges and, if warranted, develop recommendations for future activities.

Methods

After reviewing the relevant literature, researchers conducted interviews and collected incident data from three railroad carriers and one in-land barge carrier that undertook safety rules revision. Researchers conducted structured interviews with 11 participants, including safety executives, union officials, and front-line employees, along with open-ended interviews with rules revision consultants and other involved parties. The study analyzed relevant incident data from two of the railroads and one barge line for trends before and after the implementation of safety rules revision using regression models.

CONCLUSIONS

Safety Culture. This study identified a number of potential benefits related to safety rules revision. For example, interviewees claimed that as a result of the rules revision process, the safety culture was improved because the workforce valued the new rulebooks and complied with them. In addition, labor-management relations improved.

Incident Rates. Incident rates are calculated by taking the number of FRA reportable incidents (injuries, illnesses, deaths) per number of full-time equivalent workers per year. A preliminary analysis of incident data at three carriers suggested that safety rules revision had a

positive impact on incident rates at one rail carrier (KCS), where there was a statistically significant ($p < 0.01$) improvement in incident rates beginning in 1999 (Figure 1). Interestingly, safety improvements began with management preparation activities before the actual rules revision effort, including a more developmental approach to rule violations and the hiring of a rules revision consultant to identify issues and build trust. There may be a number of reasons why the rates increased in 2002 and further research would help examine this. Declines at the other two carriers could not be attributed with complete confidence to the process due to other changes that occurred at the same time, but available data do not fully rule out a positive impact on incident rates.

Liability and Injury Costs. Safety executives at two carriers reported that the number of FELA claims and the cost per claim dropped significantly as a result of the effort. One executive suggested that FELA liability in his company decreased due to the increased clarity of the rulebooks and the decrease in the number of rules.

Implementation Strategies. Several respondents mentioned that buy-in at all levels of the company, from front-line workers to senior management, was critical to successful implementation. All respondents noted the importance of rank-and-file union members' involvement in the process, and many mentioned that successful implementations were preceded by senior management activities to ensure increased participation of the workforce in safety. Respondents perceived project facilitation by an external consultant as helpful.

Challenges. Respondents indicated that several challenges must be overcome to successfully implement the rules revision process. For example, most respondents mentioned that companies must allow time to work out differences of opinion. In addition, companies must address resistance from managers who fear that the process amounts to what some interviewees considered "giving the keys to the inmates," and resistance from labor who suspect that the new rulebook will be used to "hammer" people, just like the old one.

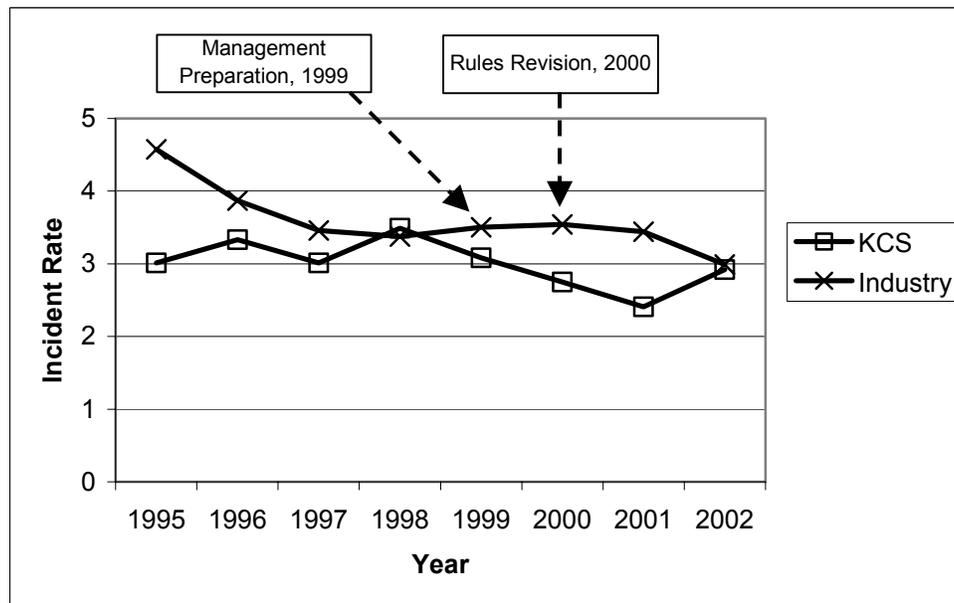


Figure 1. KCS and industry incident rates comparison, 1995-2002



Future Direction and Activities

Given the significant costs associated with FELA claims in the industry, further documentation of the reductions in the number and cost of FELA claims may help substantiate the benefits of safety rules revision. The role of management commitment to safety also warrants further consideration. KCS management began to build trust with their workforce before rules revision, which seemed to contribute to a significant reduction on injury rates.

Want More Information?

Additional information on this study will be provided in the report:

Ranney, J. and Nelson, C. "The Impact of Safety Rules Revision on Incident Rates, Liability Claims and Safety Culture in the U.S. Railroad Industry: Final Report."

This report will be available in Spring 2003 on the FRA website <http://www.fra.dot.gov>.

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