



Canadian Pacific Railway Investigation of Safety-Related Occurrences Protocol Considered Helpful by both Labor and Management

SUMMARY

The Federal Railroad Administration (FRA) Human Factors Research and Development (R&D) Program sponsored an Alternative Safety Measures Program designed to explore alternative methods for evaluating whether safety programs improve safety outcomes and the underlying safety culture, and to conduct implementation and impact evaluations of promising safety programs in the railroad industry. The Canadian Auto Workers Union (CAW) and Canadian Pacific Railway (CPR) are interested in learning more about the effectiveness of their safety programs and have provided data for this evaluation. An initial review of surveys, interviews, and focus groups conducted with CPR management and labor employees suggests that the Investigation of Safety-Related Occurrences Protocol (ISROP) program, a standardized process developed by CPR for conducting thorough and systematic incident investigations, is considered more helpful than previous investigation approaches, particularly in identifying contributing factors and corrective actions. On a survey distributed to three CPR Mechanical Services sites where ISROP has been used, respondents indicated that investigations are better “Today” than “Before ISROP” (Figure 1).¹ Additional information about ISROP was obtained through interviews, focus groups, and reports generated during ISROP investigations. Although positive comments about ISROP were provided at each site, some people suggested that it is too time-consuming for less serious injuries and can be confusing for investigators who do not use it often. More detailed analyses will be conducted to learn more about the impact of ISROP.

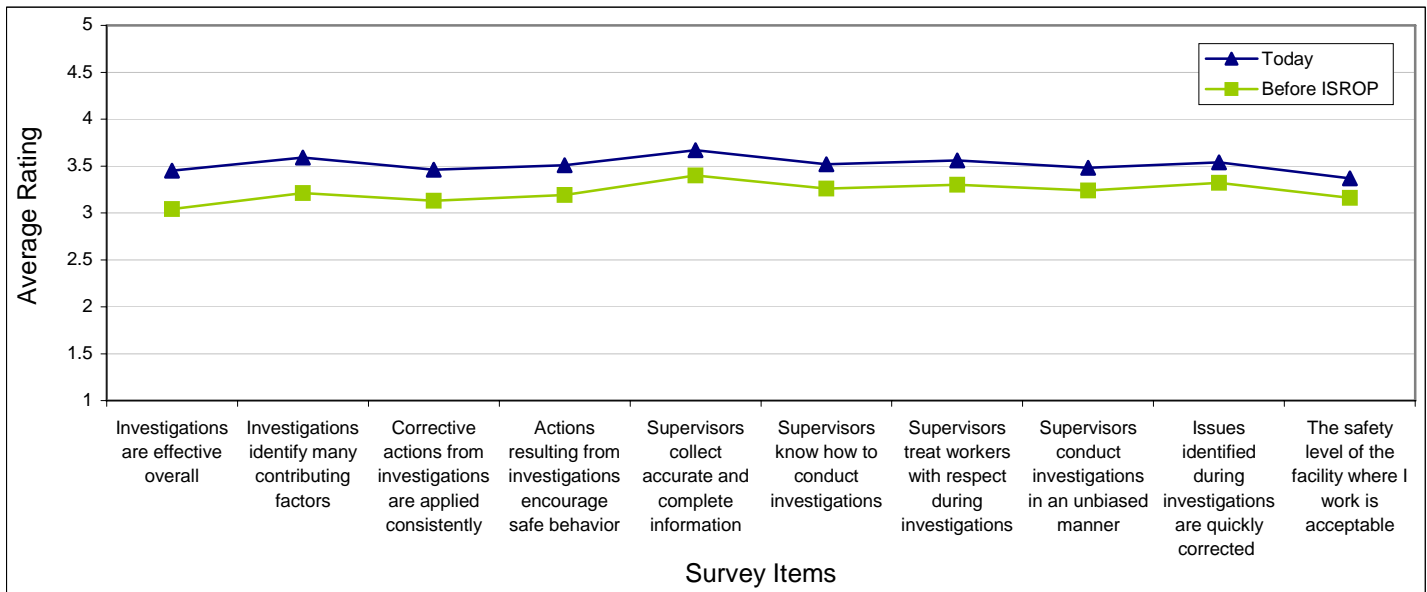


Figure 1. Surveys Indicate the Investigation Process is More Effective “Today” than “Before ISROP”

¹ Survey responses are on a scale from 1 (“Strongly Disagree”) to 5 (“Strongly Agree”). All differences between “Before ISROP” and “Today” are statistically significant at the 0.05 level using two-tailed t-tests with independent variance estimates.



BACKGROUND

Current measures of organizational safety performance in the U.S. railroad industry focus almost exclusively on statistics, such as worker injuries and train accidents, but as rates for these incidents decrease, they are less sensitive in detecting the impact of safety programs, especially short-term impacts. FRA's Human Factors R&D program is interested in identifying alternative ways to measure safety, such as operating and safety culture indicators that have been used successfully in other industries.

The CPR Mechanical Services department and the CAW, interested in learning more about the effectiveness of their safety programs, provided data to support this research, including more than 600 safety culture surveys, participation of more than 80 employees in interviews and focus groups, and operating data from a variety of railroad sources. This paper describes some early findings of this evaluation, which is scheduled to continue into 2008.

To improve investigation effectiveness, CPR developed the ISROP investigation process to standardize investigation procedures, increase the quality and amount of data collected, improve analysis of the data, enhance understanding of contributing factors, and enable CPR to develop and implement more effective corrective actions. ISROP has been a voluntary program at CPR since late 2002; many managers and CAW Health and Safety Committee members have received ISROP training and have participated in investigations.

Three CPR Mechanical Services sites where ISROP has been utilized to varying extents are participating in this study: Toronto, where ISROP has been used extensively; Winnipeg, where ISROP has been used to a somewhat lesser degree; and Coquitlam, where ISROP has rarely been used.

OBJECTIVES

One objective of FRA's Alternative Safety Measures Program is to determine the usefulness of alternative methods for evaluating the effects of safety programs on safety outcomes and the underlying safety culture in the railroad industry. Another objective is to analyze promising safety programs, such as CPR's ISROP program, to evaluate their effectiveness and how they could be improved.

An additional objective is to distribute lessons learned from this research program to promote improved safety measurement and performance across the entire railroad industry. The primary objective of this report is to present preliminary results from the ISROP evaluation.

METHODS

Surveys. A safety culture survey with items found to influence safety outcomes in many published studies and with items specifically related to incident investigations was administered by CPR to management and CAW employees at the three study sites. Of the 626 respondents who completed the survey, approximately 125 indicated that they were familiar with ISROP and answered investigation items, which asked them to rate certain aspects of investigations on a scale from 1 ("Strongly Disagree") to 5 ("Strongly Agree") for both "Before ISROP" and "Today."

Interviews and Focus Groups. Interviews and focus groups on a range of safety-related topics, including ISROP, were conducted with 83 management and CAW employees, at the three study sites. Multiple researchers reviewed the data and identified the most common themes through a consensus process.

ISROP Reports. More than 100 ISROP reports were collected and reviewed to learn more about the corrective actions that have been identified using ISROP.

RESULTS

Surveys. Survey results from the three study sites indicate that employees believe that the investigation process is more effective "Today" than "Before ISROP" for all 10 sets of investigation items on the survey, as summarized in Figure 1. Although the average scores are between 3 ("Neutral") and 4 ("Agree") for all of the ISROP survey items, all of the "Today" scores are significantly higher than the corresponding "Before ISROP" scores at the 0.05 level using two-tailed t-tests with independent variance estimates.

Interviews and Focus Groups. During the interviews and focus groups, respondents indicated that ISROP helps investigators collect better information for identifying contributing factors and corrective actions.

As one manager explained:

“You get corrective actions you can work with. It [ISROP] allows you to take your finger and point at a chain of events and say that is what can be fixed.”

In one example, a re-enactment during an ISROP investigation revealed that trashcans were too big, trash was too heavy (over 100 pounds), and the lift was too high for shorter workers. The manager that investigated explained:

“I went down the stairs [angry], but when I came up, I ordered 48 new [trash] cans, plus lids. In this injury, the can tipped over and he tried to stop it, which led to a lost time FRA injury.”

Many CAW members also claimed that ISROP is helpful, such as one who said:

“ISROP gave me more insight into the investigation process. It gave me more avenues to probe to understand the exposure to safety hazards.... It is more thorough than other investigation processes. It is a good tool, if they use it. It can give you a breakdown of what happened, not just one person’s opinion. It is more factual.”

When asked how ISROP could be improved, many people commented that they would like to have a simpler version for minor incidents, since some components of ISROP are not relevant for those investigations. They thought that would make the process less confusing and time-consuming for investigators who only use it rarely. As one manager explained:

“We need to [make ISROP simpler] for dealing with minor incidents. There is a lot of nomenclature in there that people don’t know. There are factors in there that can be confusing if you don’t work with it.... People agonize over small issues with ISROP that they should not have to.”

During the interviews and focus groups, CAW members indicated that for ISROP to be most effective, injured workers should not be disciplined, as people are less inclined to provide information if they fear it will be used against them.

ISROP Reports. Reports generated during ISROP investigations show that investigators have identified a variety of corrective actions while using ISROP. For example, Figure 2 shows a re-enactment during the investigation of an injury that occurred when a worker was pulling cables over the threshold of a storage trailer on a rainy day. When the employee pulled on the hand truck to overcome the elevated threshold, his feet slipped on the wet floor causing him to fall. One corrective action identified during the investigation was to build up the approach to the trailer threshold, so hand truck wheels would not catch on it (shown in Figure 3); another corrective action was to purchase a more appropriate hand truck for hauling cables.



Figure 2. ISROP Re-enactment of Events Leading to Injury at Trailer Threshold



Figure 3. Built Up Approach to Trailer Threshold (Corrective Action)



CONCLUSIONS

Both management and labor consider ISROP to be more helpful than previous investigation processes. For example, they indicated that it encourages investigators to identify more contributing factors, conduct investigations in a less biased manner, and implement better corrective actions. The primary concerns about ISROP identified during this evaluation are that it can be confusing and time-consuming for investigators who only use it occasionally, and it will not work well if employees are disciplined for their injuries.

FUTURE DIRECTION AND ACTIVITIES

FRA's Alternative Safety Measures Program, scheduled to extend into 2008, will continue to assess the effectiveness of CPR safety programs, such as ISROP, and will use studies like these to help identify reliable alternative safety measures for evaluating safety programs. For example, CPR operating data will be collected and analyzed to search for leading, as opposed to lagging, indicators of safety. CPR will administer safety culture surveys again near the end of the study to determine if perceptions have changed at CPR, and additional interviews and focus groups will be conducted to gather more information about safety program effectiveness. The analyses presented in this paper will also be performed again as more data become available.

WANT MORE INFORMATION?

Findings from another CPR safety program analyzed in this study, 5-Alive, can be found in the following Research Results report:

Canadian Pacific Railway Mechanical Services' 5-Alive Safety Program Shows Promise in Reducing Injuries, March 2006, Research Results RR 06-14.

This report is available on the FRA Web site (<http://www.fra.dot.gov>).

The 5-Alive program at CPR focuses on increasing awareness of and compliance with certain safety rules that when violated have a significant potential to lead to fatalities and serious injuries.

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