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**RESEARCH RESULTS**  
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## C<sup>3</sup>RS is Implementing Corrective Actions and Expanding Within the Railroad Industry

### SUMMARY

As the Federal Railroad Administration (FRA) implements the Confidential Close Call Reporting System (C<sup>3</sup>RS), FRA has been sponsoring a Lessons Learned Team (LLT) that seeks to answer three questions:

1. What conditions are necessary to implement C<sup>3</sup>RS successfully?
2. What is the impact of C<sup>3</sup>RS on safety and safety culture?
3. What factors help sustain C<sup>3</sup>RS over time?

Participants in the pilot program include Union Pacific Railroad (UP), Canadian Pacific Railway (CP), New Jersey Transit (NJT), and Amtrak. Each railroad's study is five years long. The LLT is publishing Research Results Reports that provide the public with the evaluation's findings [1]. This report contains findings from across the sites using these data sources: (1) interviews with stakeholders and (2) redacted C<sup>3</sup>RS program data.

### Cross-Site Data at Midterm

The four demonstration sites started the C<sup>3</sup>RS program at different times. Figure 1 displays data from 2007-2013. In this figure, the data from each site's first three years are superimposed for comparison. The average number of close call reports varied between 0.60 and 2.96 reports/100 eligible employees per month.

The sites analyzed the close call reports and addressed any safety concerns with corrective actions. Examples included: improving paperwork about restricted speed areas, adding visual cues for switch status, and improving procedures for protecting track workers.

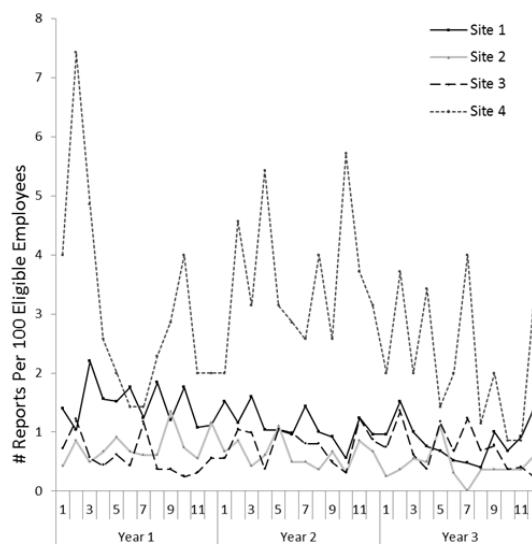


Figure 1: Number of Reports to C<sup>3</sup>RS per 100 Eligible Employees

### Data on Expansion

The FRA began expanding the C<sup>3</sup>RS program in 2014 and invited other railroads to participate in the program. So far, five additional passenger railroads have joined. In total, the FRA C<sup>3</sup>RS program has received 5162 reports between February 2007 and June 2015.

### BACKGROUND

The C<sup>3</sup>RS process is as follows: 1) Employees' report close calls to a neutral third party, either the U.S. Bureau of Transportation Statistics (BTS), or the National Aeronautics and Space Administration (NASA). 2) The third party de-identifies the reports and then passes "sanitized information" to a joint labor-management-FRA Peer Review Team (PRT) which is trained in a collaborative, Multiple Cause Incident Analysis (MCIA) methodology. 3) The PRT conveys



recommendations for corrective action to local and corporate management (sometimes through a formal PRT Support Team) for review and possible implementation [2].

### OBJECTIVES

This evaluation should examine methods for successfully implementing C<sup>3</sup>RS, review its impact on safety and safety culture, and determine the conditions that would lead to the long-term viability of C<sup>3</sup>RS (for previous findings see [1]).

### METHODS

#### Stakeholder Interviews

*Phased interviews* at baseline, midterm, and final phases were conducted with railroad employees and managers who were involved or affected by the C<sup>3</sup>RS program. Interviewees were asked about the impact of C<sup>3</sup>RS in terms of safety and safety culture.

*Implementation interviews* throughout the evaluation were held with key stakeholders such as PRT members, senior managers, labor officials, FRA, the Volpe Implementation Team, BTS, and NASA. Interviewees were asked about key events affecting the C<sup>3</sup>RS program, and their opinions concerning impact and sustainability.

#### C<sup>3</sup>RS Program Data

The evaluation team employed multiple types of qualitative data: (1) summary of close call cases reported to and de-identified by BTS, NASA, or the railroad; (2) PRT-developed documents and newsletters; (3) evaluation team field notes and the [C<sup>3</sup>RS website](#). These data were used to assess the implementation of the program and its outcomes.

### CROSS-SITE RESULTS AT MIDTERM C<sup>3</sup>RS Sites Collecting Close Call Reports

All four sites consistently received reports during their first three years in C<sup>3</sup>RS (Figure 1). This figure shows the number of individual reports

submitted by employees. The number of eligible employees per site fluctuated with business conditions and changed as the number of locations and crafts that were eligible to participate expanded. To control for variations, the number of reports per month was divided by the approximate number of employees that were eligible to participate in C<sup>3</sup>RS that month at that site. The average number of reports to C<sup>3</sup>RS per 100 eligible employees is shown in Table 1.

All four sites submitted reports over the first three years of their participation in the program. The analysis of the final data will examine possible trends in reporting rates.

Table 1: Number of Reports to C<sup>3</sup>RS per 100 Eligible Employees by Site

Railroad	Average Number of Reports Per month Per 100 Eligible Employees
Site 1	1.15
Site 2	0.60
Site 3	0.70
Site 4	2.96

### Corrective Actions Implemented to Address Safety Concerns

All participating railroads implemented corrective actions, most of which were “local” because their changes only affected the worksite in which the PRT was active, and it did not extend across organizational boundaries (e.g. geographical regions or business units). Thus, in all railroads, reports were submitted to PRTs, who were able to analyze the reports and recommend corrective actions. The railroad managers were willing and able to implement recommended changes.

The railroads focused corrective action on the most frequently identified issues from close call reports. Some examples are shown below.

#### Actions to Reduce Excess Speed

- Reorganized the format and clarified the



presentation of paperwork containing information about speed restrictions

- Added a clip to the cab, thus allowing paperwork with train instructions to be kept in line of sight.

Actions to Reduce Run-through Switches and Derailments

- Placed a camera in the yard, so the foreman could check equipment placement before throwing a cross-over switch
- Improved visual cues for the status of switches
- Provided training on how to back up out of a yard

Actions to Prevent Collisions with Vehicles and People

- Added contract provisions prohibiting contractors from using cell phones in the yard
- Placed barriers between parking lots and track

Actions to Protect Track Workers

- Improved policies for setting and removing blue flag markings that indicate when people are working on a section of track.

Actions to Improve Overall Safety

- Improved job safety briefing
- Additions to employee training

**FINDINGS ON EXPANSION**

**FRA Expanding the C<sup>3</sup>RS Program**

The FRA began expanding the C<sup>3</sup>RS program in 2014 by inviting other railroads to join, and it has had some initial success. Primarily, passenger railroads have joined. Specifically:

- May 2014 –Strasburg Rail Road joined which is a short line heritage railroad near Strasburg, Pennsylvania, operating excursion trains hauled by steam locomotives.
- March 2015 – Long Island Rail Road joined extending to the eastern tip of

Long Island from New Your City terminals.

- April 2015 – Metro-North joined, which extends to suburban NY and Connecticut from New York Grand Central terminal
- August 2015 – Metra Direct joined, which services some counties in the Chicago area.
- August 2015 - Massachusetts Bay Transportation Authority (MBTA) and Keolis Commuter Services joined, which services Boston

To learn which labor unions and what types of close calls are eligible for C<sup>3</sup>RS reporting, see each site’s Internal Memorandum of Understanding (IMOU) on the C<sup>3</sup>RS website [2].

While the LLT is not collecting data for the new locations in this evaluation, the fact that new railroads are joining is a positive sign for the sustainability of the program, and will be discussed in the final report.

**Total Reporting Since C<sup>3</sup>RS Started**

5,162 reports were submitted to C<sup>3</sup>RS between the beginning of the demonstration pilot in February 2007 and June 2015 (Figure 2). This number includes both reports submitted to BTS and NASA from all of the demonstration pilots, as well as the new sites. The numbers have continued to grow. As this Research Result was being written, three demonstration sites have completed their demonstration, one of them has joined the industry-wide roll out of C<sup>3</sup>RS, and two have not.

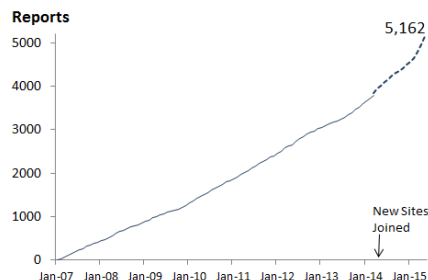


Figure 2: Cumulative Number of Reports to FRA’s C<sup>3</sup>RS Program



## CONCLUSIONS & FUTURE DIRECTION

At the beginning of the C<sup>3</sup>RS pilot demonstration, it was not obvious that a close call program could succeed in the railroad industry. The midterm results presented here (about 3 years after each site joined C<sup>3</sup>RS), suggest that C<sup>3</sup>RS is successful, measured by (or based on) employee report submissions. Employees are submitting reports. Corrective actions are being devised and implemented. The FRA perceived enough value in the program that it invited five new passenger railroads to join C<sup>3</sup>RS and each railroad accepted its invitation.

The C<sup>3</sup>RS evaluation set out to answer questions.

1. What conditions are necessary to implement C<sup>3</sup>RS successfully?
2. What is the impact of C<sup>3</sup>RS on safety and safety culture?
3. What factors help to sustain C<sup>3</sup>RS over time?

The results reported here show that C<sup>3</sup>RS can be successfully implemented, that it can have impact (because corrective actions are implemented), and that it can be sustained (as indicated by its expansion to new railroads). Other LLT reports present findings that address questions of impact and factors needed for successful implementation and sustainability [1]. The LLT shall complete the final evaluations at the four demonstration sites and write a final report addressing the three evaluation questions in full which will be published. Additional Research Results will be published as additional findings become available.

## REFERENCES

- [1] FRA Research Results for C<sup>3</sup>RS  
<https://www.fra.dot.gov/Page/P0822>
- [2] Confidential Close Call Reporting System. (C<sup>3</sup>RS) website. <http://www.fra.dot.gov/c3rs>

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## KEYWORDS

Close calls, continuous improvement, employee involvement, freight rail, human factors, passenger rail, risk reduction, safety culture

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