SHORT LINE SAFETY INSTITUTE: TESTING THE FIDELITY OF ITS ROBUST MODEL

SUMMARY

The Short Line Safety Institute (SLSI) is dedicated to the continuous improvement of safety and safety culture across all short line and regional railroads in the United States. Strengthening a railroad's safety culture may result in less frequent or severe accidents and create a safer working environment. SLSI defines safety culture as the shared values, actions, and behaviors that demonstrate a commitment to safety over competing goals and demands, based on the U.S. Department of Transportation (DOT) Safety Council's safety culture definition (Morrow & Coplen, 2017).

SLSI conducted a study to assess the fidelity of its Safety Culture Assessment (SCA) model. This report summarizes findings from this study and discusses areas for enhancement of the assessment process.

BACKGROUND

Since 2015, SLSI has conducted voluntary, non-punitive, and confidential assessments of the safety culture at participating short line and regional freight railroads (i.e., Class II and Class III railroads) across the United States. SLSI uses a multi-method model that has been recognized as "the most robust assessment model in the industry" by a Volpe National Transportation Systems Center (Volpe) evaluation (Kidda & Howarth, 2019). SLSI's SCA model, which includes interviews, on-site observation, and surveys, continues to provide tangible, action-oriented results for participating railroads.

SLSI uses independent contractor Assessors to conduct the SCAs. These Assessors are subject matter experts and highly dedicated to their work with SLSI.

OBJECTIVE

The objective of the fidelity assessment is to assess how well SLSI's Assessors adhere to the protocols of the SCA model to evaluate a railroad's safety culture. It also identifies any room for improvement in the SCA process, protocol language, and future Assessor training.

METHODS

SLSI observed each process of the SCA model for various locations and Assessor teams. This included large (>25 employees) and small (<25 employees) railroads and activities conducted in person and over the phone. A total of seven different locations and seven Assessors were observed. SLSI evaluated whether each Assessor adhered to the protocols established for each part of the SCA from Readiness Screening to Post-Assessment Call. Measures included "yes/no" agreement observations as well as "very high/very low" conformance scales. Interviewees and Assessors were also given a questionnaire to measure their engagement with and sentiments toward the overall SCA process.

SCA Elements. The SCA includes various elements such as Advanced Coordination Meetings, Kick-Off Meetings, Interviews, Observations, Document Inventories, Close-Out Meetings, Post-Assessment Calls, and Feedback Surveys. Each element of the SCA includes a step by step written protocol that is available to all Assessors. Additional tools are also provided as needed (e.g., report writing templates and observation checklists).

ANALYSIS

Data analysis included content coding of interviewee and Assessor engagement interviews. Frequencies of emergent themes were then calculated as percentages. Volpe conducted an analysis of the agreement and conformance scores produced for each SCA element observed. Lastly, SCSI carefully reviewed all protocols and documents.

RESULTS

Frequency analyses revealed the prevalence of protocol adherence and deviation. A thorough evaluation of all protocols and documents also highlighted areas for improvement. Key results are listed below.

Figure 1 and Figure 2 show the aggregated results for each of the SCA activities measured across three railroads. While the fidelity was measured for seven railroads, only three of the railroads contained data for all assessment activities. The remaining four railroads were evaluated only for the pre-assessment and post-assessment activities. Since the scores were all 100 percent for the completion scores and not completed for the agreement scores, their data would not change either figure's data.
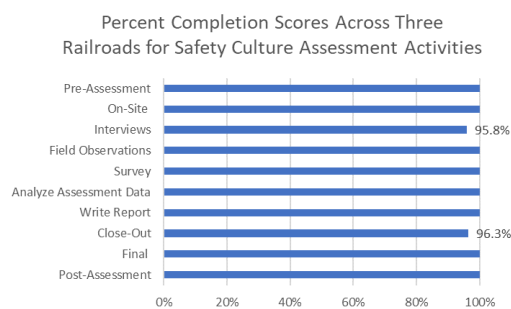

Figure 1. Compliance scores for each SCA element

Figure 1 shows the percent completion scores for activities involving a binary task (i.e., completed or uncompleted). Of the 10 assessment activities, only 2 showed less than 100 percent completion. Interviews showed a 95.8 percent completion score while the Close-

Out Meeting showed a completion score of 96.3 percent. These were the only activities for which the completion score was less than 100 percent.
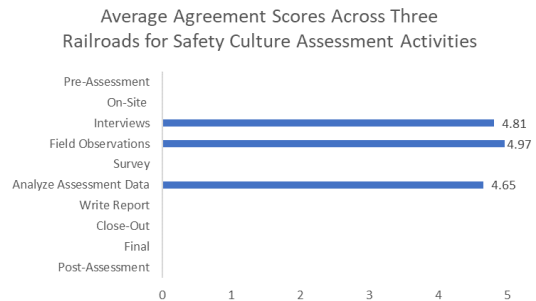

Figure 2. Agreement scores for SCA elements

Figure 2 shows agreement scores for three of the activities where assessors may diverge in their judgements. These activities included interviews, field observations, and analysis of the assessment data. All three activities registered scores over 4 on a scale where 0 represents no agreement among Assessors and 5 represents complete agreement. The data suggests that the Assessors mostly agreed in their judgments about each railroad's interviews, observations, and data analysis.

Overall, this data suggests that the Assessors closely follow the procedures designed to assess a railroad's safety culture. Opportunities for improving the process were found in the Close-Out Meeting and Interview activities.

Fidelity Strengths

- Protocol Compliance and Agreement: SLSI Assessors mostly complied with all SCA protocols and procedures.

- Assessor Engagement: SLSI Assessors (N = 7) expressed confidence in the SCA process and protocols (100 percent). They considered their interactions with railroads valuable to both themselves (100 percent) and the industry (100 percent). All Assessors provided ideas for improving the SCA process (e.g., additional Assessor training and networking events).

- Interviewee Engagement: Interviewees (N = 31) expressed satisfaction with the interview process (100 percent), confidence in SLSI's dedication to confidentiality (100 percent), and were comfortable with SLSI being on their property (83.87 percent). Only 16.13 percent of interviewees provided ideas for improving the interview process. These ideas mostly concerned the length of some of the interview questions.

Fidelity Opportunities for Improvement

- Updating of Protocols: Some protocols and documents were out of date, listing procedures that were no longer in place and information that was no longer accurate. Updating these protocols will assist in providing all Assessors with the most up-to-date information and maintaining consistency among Assessor behaviors.

- Conformity of Protocols: Some protocols and documents included differing formats, fonts, headers, and footers. Conformity of these protocols will assist in the overall visual professionalism of the SCA process and could help Assessors better organize their documents.

- Creating New Protocols: The Observation element of the SCA model includes vehicle, facility, and work observations. There is currently one protocol listed, but a specific protocol for each of the three observations may provide additional clarity for each activity.

- Assessor Refresher Training: SLSI could provide training to remind Assessors of protocols, locations of documents, and the use of documents, also receiving feedback from the Assessors. During future training, Assessors could be refreshed on Close-Out Meeting and Interview protocols to ensure that these protocols are being carefully followed.

CONCLUSIONS

SLSI's fidelity assessment suggests there is a high Assessor conformance to SCA protocols and procedures. However, there are also some areas for improvement. By assessing its fidelity and examining the practices of its Assessors, SLSI can gain further insight into its robust process. With this information, SLSI can fine tune its protocols, procedures, and Assessor training, fulfilling its goal of continuous improvement.

FUTURE ACTION

This fidelity assessment highlights opportunities for improvement for SLSI. SLSI continues to update and manage its protocols to provide the most accurate information to the Assessors and maintain consistency in Assessor behaviors across SCAs.

SLSI also continues to provide annual Assessor training. Findings from this study can be shared with Assessors and used as a tool during this training.

REFERENCES

Kidda, S., & Coplen, M. (2016). Short Line Safety Institute Pilot Safety Culture Assessment Project: Development of Assessment Tools (Report No. RR 16-03). Federal Railroad Administration.

Kidda, S., & Howarth, H. D. (2019). Short Line Safety Institute: The Most Robust Model for Assessing Safety Culture in the US Railroad Industry (Report No. RR 19-15). Federal Railroad Administration.

Morrow, S., & Coplen, M. (2017). Safety Culture: a Significant Influence on Safety in Transportation (Report No. DOT/FRA/ORD-17/09). Federal Railroad Administration

CONTACT

Starr Kidda, Ph.D.
Human Factors Division Chief
Federal Railroad Administration
Office of Research, Development, and
Technology
1200 New Jersey Avenue, SE
Washington, DC 20590
(202) 306-2011
Starr.Kidda@dot.gov

Julia Leone, Ph.D.
Manager of Research and Organizational
Development
Short Line Safety Institute
50 F Street, N.W., Suite 500
Washington, DC 20001
(202) 628-5349
Julia.Leone@shortlinesafety.org