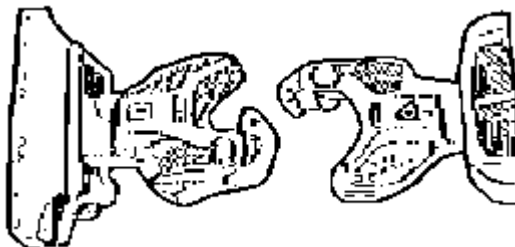


Switching Operations Fatality Analysis (SOFA) Working Group (SWG)

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Switching Operations Fatality Analysis (SOFA) Working Group (SWG)

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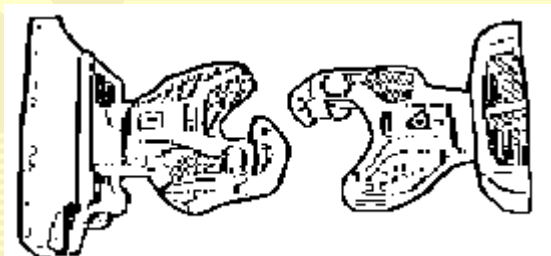
Formed in February 1998, the SOFA Working Group (SWG), made up of railroad industry representatives, has undertaken a number of activities since the release of its *SOFA Report: Findings and Recommendations of the SOFA Working Group*, in October 1999. That report was based on the review of 76 fatalities that occurred to railroad employees engaged in switching operations from January 1, 1992 through July 1, 1998.

The SWG activities have been directed towards achieving the goal of Zero Switching Fatalities:

- reviewing the 48 switching fatalities that occurred through December 2003, since the 76 fatalities upon which the *SOFA Report* was based;
- drawing the attention of those engaged in switching operations to the Five Operating Recommendations made in the *SOFA Report*;
- identifying ‘Special Switching Hazards’ such as close clearance, being struck by mainline trains, and shoving that resulted in switching fatalities that were not necessarily preventable by one or more Operating Recommendations;
- studying Severe Injuries, such as amputations, that cause harm to employees engaged in switching operations; and
- publicizing information about the number and types of switching fatalities and Severe Injuries.

In serving as an update, this report describes SWG activities. These activities are important because through December 2003, there have been 38 switching fatalities since the release of the *SOFA Report*. Of these 38 fatalities, 17 (45 percent) may have been avoided had the Operating Recommendations been followed. This possibility demonstrates the need for continuing education to reach the goal of Zero Switching Fatalities.

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Summary of Report Contents

This report consists of five sections, an appendix, and data appendix:

- *Section 1: Introduction to SOFA Update.* Review of SWG activities resulting in the publication of the *SOFA Report* in October 1999.
- *Section 2: SOFA Working Group Activities.* A discussion of SWG activities since the publication of the *SOFA Report* in October 1999.
- *Section 3: Switching Fatalities.* A complete list and description of the 124 switching fatalities that occurred from January 1992 through December 2003. The fatalities are classified by Operating Recommendations; or, if none apply, by type of event or characteristic.
- *Section 4: Switching Fatalities – Understanding and Prevention.* Classifying the 124 fatalities for understanding and prevention.
- *Section 5: SOFA-defined Severe Injuries.* Severe Injuries by various characteristics and track location.

Appendix:

A: SOFA Implementation Guidelines for Operating Recommendations

B: Origin of SOFA Working Group

C: Original Introduction to *SOFA Report*, October 1999

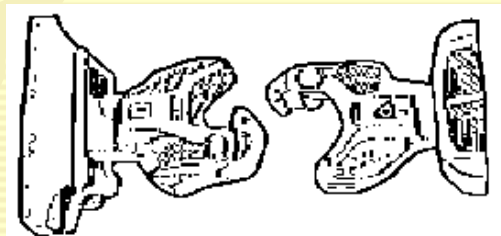
D: Five Operating Recommendations

E: Obtaining Electronic Versions of SOFA Reports

F: Examples of Job Briefings—Operating Recommendation 4

Data Appendix

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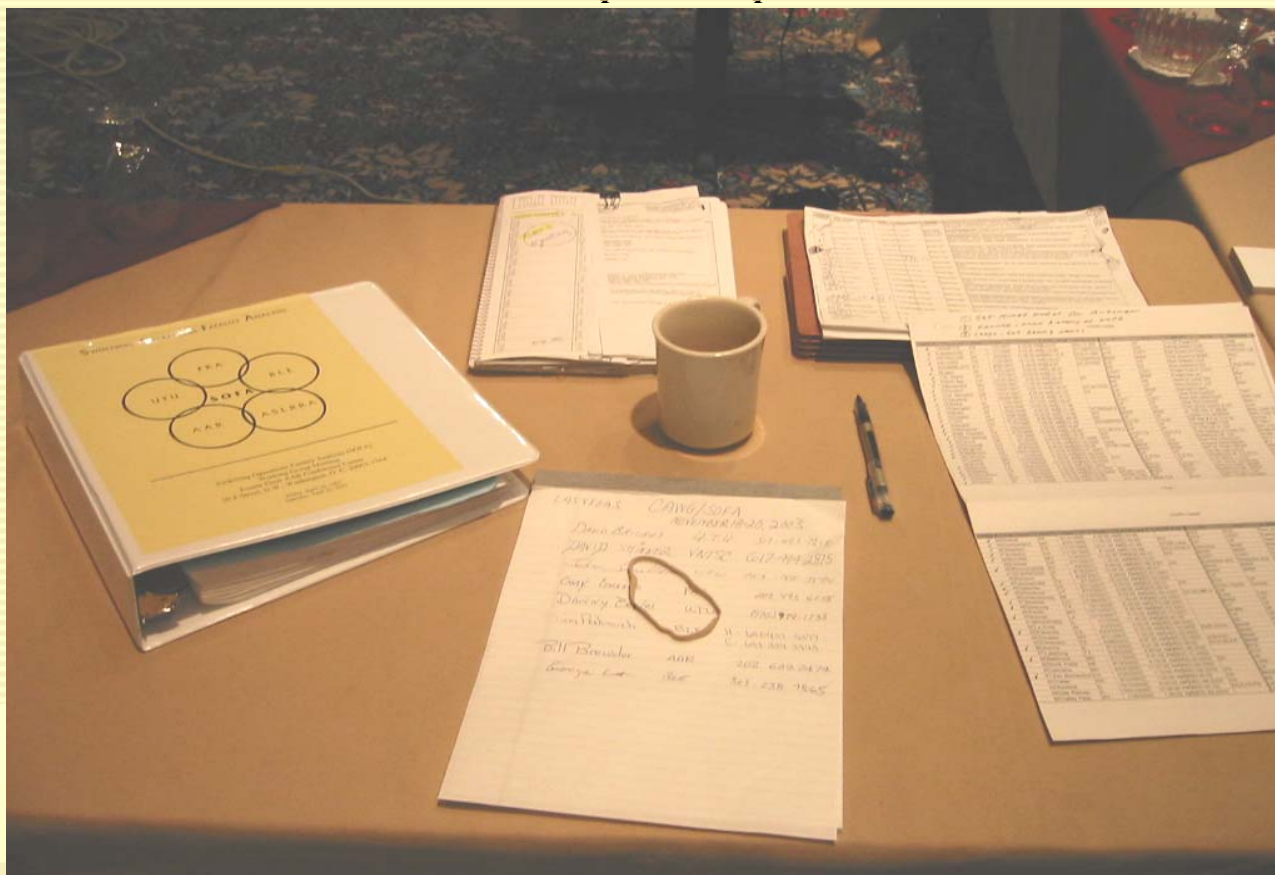




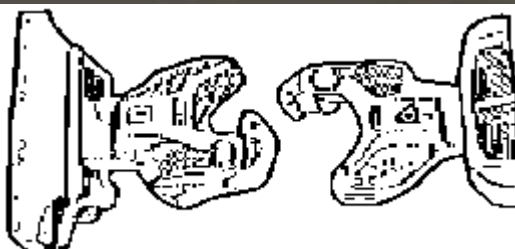
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Operating Recommendation Cases

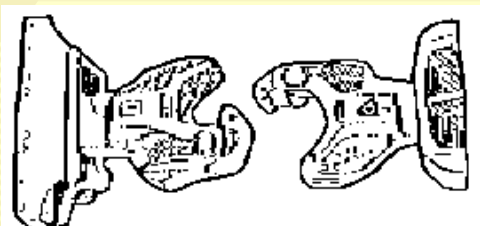
Of the 124 switching fatalities, 64 involve one or more Recommendations – 52 percent as shown in Table 3-1. Note that because a fatality case can involve more than one Recommendation, as 16 of the 64 fatality cases do, the number of Recommendations cited by the SWG is greater than the number of cases that have Recommendations applying. Two of the 16 cases involved 3 Operating Recommendations each; the other 14 cases involved 2 Recommendations each.

The SWG firmly believes that switching fatalities directly related to the Five Operating Recommendations will be reduced when all parties accept and operate according to these Recommendations. The SWG encourages compliance with the Operating Recommendations and all other safety rules.

Table 3-1. Sixty-Four Switching Fatalities Involving Operating Recommendations

Lifesaver Applying to Operating Recommendation	Number of Fatality Cases	Percentage of 124 Fatality Cases
1-Secure equipment before action is taken.	19	15.3 %
2-Protect employees against moving equipment.	12	9.7 %
3-Discuss safety at the beginning of a job or when a project changes.	14	11.3 %
4-Communicate before action is taken.	18	14.5 %
5-Mentor less experienced employees to perform service safely.	19	15.3 %

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Recommendation Cited 82
Less multiple citations 18

Number of "Five Lifesaver" cases 64



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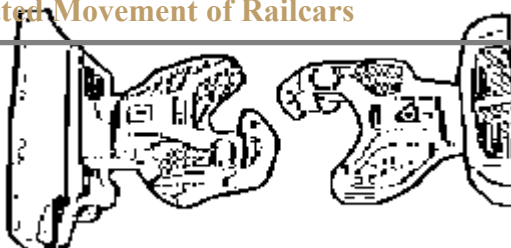
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Special Switching Hazard Cases

The remaining 60 fatality cases, those not involving an Operating Recommendation, are classified by the SWG into eleven groups (one group is a miscellaneous group), as shown in Table 3-2, based on a sequence of events leading up to the fatality, as being struck by mainline trains; or by a fatality event characteristic, such as drugs or alcohol. The SWG believes an employee's awareness of the Special Switching Hazards identified in the grouping will insure their safety and that of their crew members.

Table 3-2. Sixty Switching Fatalities Involving Special Switching Hazards

Type	Number
Close Clearance	10
Struck by Mainline Trains	8
Employee Tripping, Slipping, Falling	6
Free Rolling Railcars	6
Unsecured Cars	6
Equipment	4
Struck by Motor Vehicle or Loading Device	4
Unexpected Movement of Railcars	4





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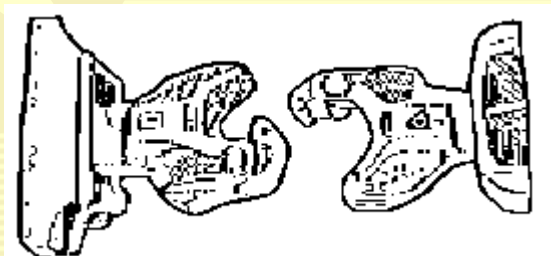
•Close Clearance

The Special Switching Hazard group with the largest number of fatalities is Close Clearance. Ten fatalities fall into this group. The number of fatalities involving Close Clearance would be greater than the ten, if those classified both as a Special Switching Hazard and an Operating Recommendation were included. To date, the SWG has identified five cases involving Operating Recommendations that also include Close Clearance. Consequently, the SWG suggests that the railroad industry emphasize awareness of all types of Close Clearance issues. Safety committees are urged to identify and mark all permanent close/no clearance areas with highly visible signs; and to re-enforce the dangers inherent when equipment is left afoul, or when employees are working adjacent to a mainline track, or conditions change regarding oversize cars that have been placed into a track adjacent to other tracks that may be used by other train crews.

•Struck by Mainline Trains

While there have been 13 of 124 cases that involved an employee being struck by a mainline train, the SWG believes that 5 of the 13 fatalities were preventable by observing Operating Recommendations. The 8 fatalities not involving an Operating Recommendation did not occur for a single reason or for a few reasons. Other than general vigilance, awareness, and alertness to the switching environment it is difficult to prescribe a preventive measure.

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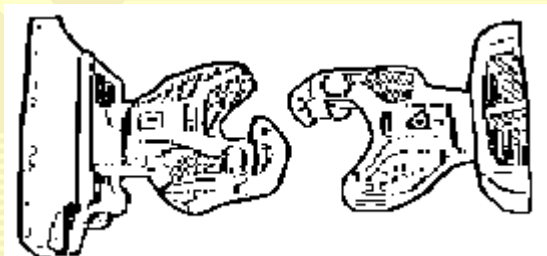
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- Shoving as a Special Switching Hazard

In reviewing the 124 switching fatalities, it was apparent to the SWG that shove movements present special risks in switching operations. Sixty-one fatalities involved shove moves. There are 116 of the 124 fatalities known to involve train movement. Thus, 53 percent (61/116) of fatalities involving movement had shoving as the direction of movement.

Whether given the amount of shoving done, compared to pulling, makes fatalities with shoving as the direction of movement over- or under-represented in switching operations is answerable only by having the appropriate number of train miles dimensioned by direction of movement. But whatever the answer is, does not change the fact that fatalities involving shoving are a sizable cluster of switching fatalities.

Shove movements clearly create an exposure to greater risk than pulled train movements. Wherever feasible, efforts should be made to avoid shoved movements especially where light engines are involved. Greater use of procedures such as running around cars and changing ends should be utilized.

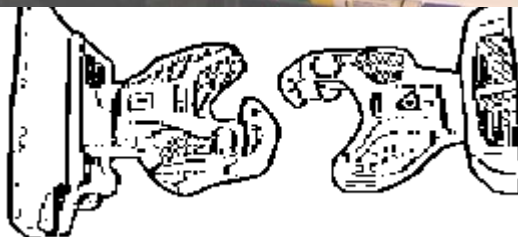
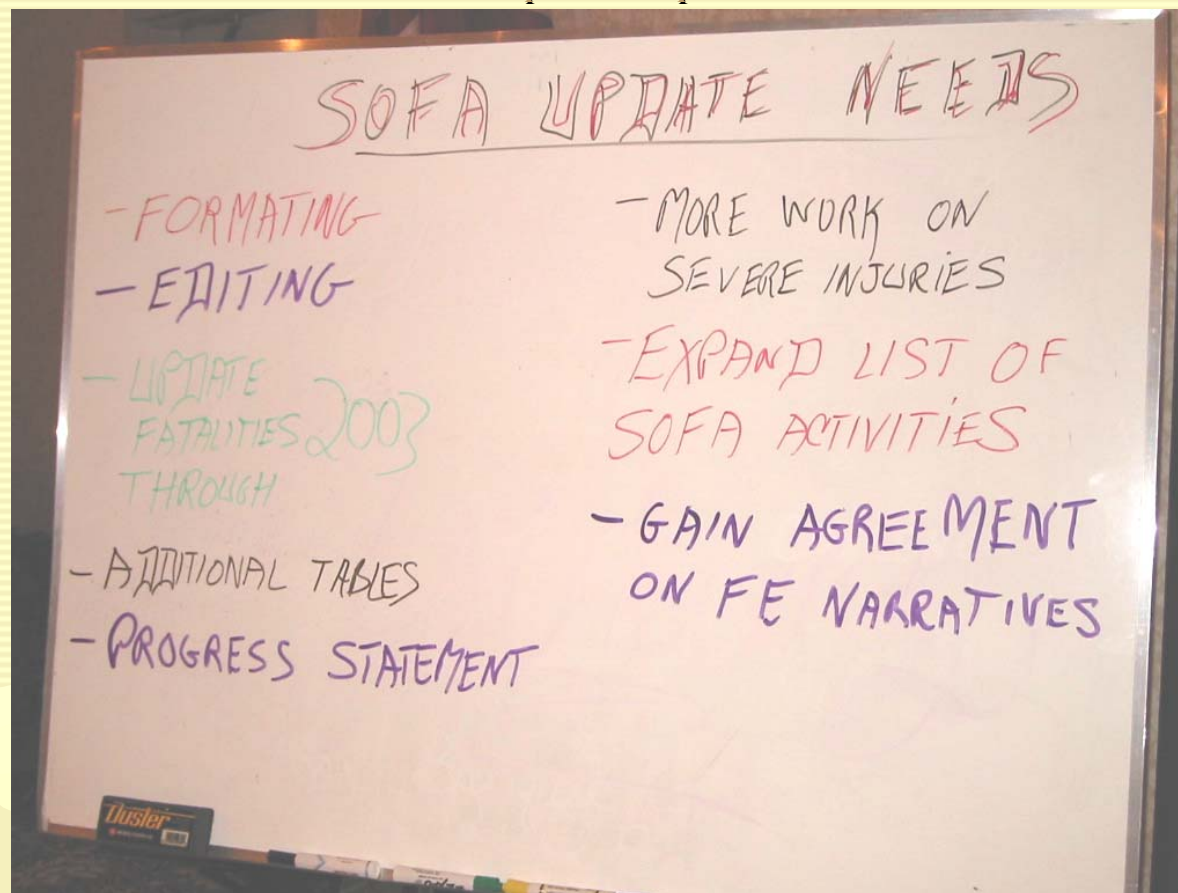




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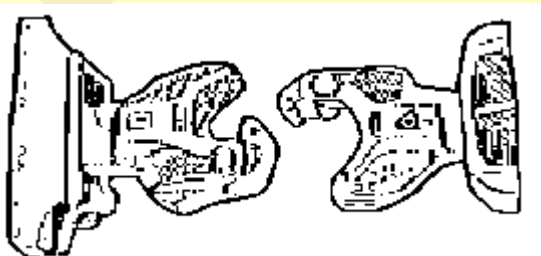
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Job Briefing and Mentoring – Operating Recommendations 3 and 5

•After examination of the 124 fatality cases, the SWG expressed concern about further identifying relevant recommendations to improve safety of switching based on the available objective data. The diversity of the events and occurrences surrounding these employee deaths was clearly evident to the SWG. This realization lead to the re-examination of Recommendations 3 and 5. It was apparent to the SWG that many of the diverse events and occurrences that lead to the death of employees may have been mitigated through effective “job safety briefing.” You can never communicate too effectively. It became apparent to the SWG that providing a minimum suggested content for an initial job safety briefing should be made available. It was also evident to the SWG that the perception of “work changes” is very qualitative and should be addressed in specific language that is understandable and comprehensible to all crew members.

•CRM promotes training in the importance of and procedures for effective intra-crew communications. The Working Group pointed out in its original report that such communications have the potential to make a major contribution to the safety of switching operations. The Working Group again recommends that the railroad industry, i.e., labor, management, and FRA, consider CRM programs that address improving crew coordination and communications. Again, compelling evidence suggests that many fatalities resulted from unexpected train movement, particularly at very low speeds. Switching operations training programs should employ the principles of CRM to assure that no opportunities are overlooked to heighten safety awareness and focus it on the serious implications of unexpected train movement, and on the importance of continual mutual awareness of the location and activities of all crew members. The initial on duty and subsequent job safety briefings afford an opportunity to focus the message and further the common goal of a safe working environment.

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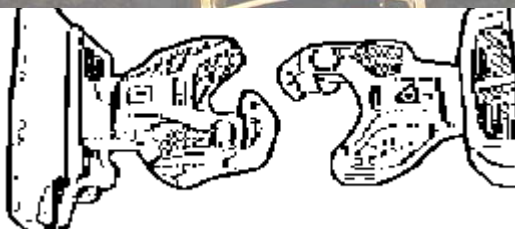




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The SOFA Working Group has issued three reports on switching casualties. All three reports may be printed out from the following FRA web addresses:

Findings and Recommendations of the SOFA Working Group, October 1999

http://www.fra.dot.gov/pdf/sofa_rep.pdf

Findings and Recommendations of the SOFA Working Group, Appendix – Volume II, August 2000 http://www.fra.dot.gov/pdf/safety/sofa/sofa_vol2.pdf

Severe Injuries to Train and Engine Service Employees: Data Description and Injury Characteristics. July 2001.

http://www.fra.dot.gov/pdf/safety/sofa/SOFA_Injury.pdf

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