

4. SWITCHING FATALITIES – UNDERSTANDING AND PREVENTION

4.1 Switching Fatalities Occur for a Reason

The SOFA Working Group (SWG) is trying to understand why each and every switching fatality occurred in working towards the prevention of switching fatalities. The SWG believes that switching fatalities happen for reasons that can be understood – and are not just random occurrences, nor a series of unlikely and unfortunate events, nor just plain bad luck. The risk to employees engaged in switching operations is real, and it can be reduced through understanding of past fatality events. Further, many switching fatalities occur for the same reason. Thus, any one of the Five Operating Recommendations, and its operating procedure, will prevent many fatalities.

The SWG developed a classification system that will:

- provide understanding of why each fatality occurred
- group similar fatalities together
- suggest preventive measures.

4.2 Switching Fatalities Involving the SOFA Five Operating Recommendations

In Section 3, the 124 switching fatalities occurring from January 1992 through December 2003 were first classified as to whether one or more of the Five Operating Recommendations applied. Sixty-four fatalities fell into that group – 52 percent. For these fatalities, the SWG believes that future fatalities of a similar nature can be prevented by implementing one or more of the Five Operating Recommendations. The Recommendations were developed from review of 76 switching fatalities and were included in the *SOFA Report* released October 1999.

4.3 Switching Fatalities Involving Special Switching Hazards

The remaining 60 fatality cases, those involving Special Switching Hazards, were classified by the SWG into eleven groups (one group is a miscellaneous group), as shown in Table 4-1, based on a sequence of events leading up to the fatality, such 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 4-1. Sixty Special Switching Hazard Fatalities Not Involving SOFA Operating Recommendations

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
Environment	3
Drugs and Alcohol	3
Miscellaneous	11
total	65
* less cases classified in two category types	5
net total	60

* FE-15-92 was classified under ‘Employee Tripping, Slipping, Falling’ and ‘Unsecured Cars’; FE-46-93, ‘Unsecured Cars’ and ‘Drugs and Alcohol’; FE-30-96, ‘Drugs and Alcohol’ and ‘Employee Tripping, Slipping, Falling’; FE-40-01, ‘Close Clearance’ and ‘Struck by Mainline Trains’; FE-09-02, ‘Close Clearance’ and ‘Struck by Mainline Trains’.

Close Clearance

The Special Switching Hazard group with the largest number of fatalities is Close Clearance. Ten fatalities fall into this group (Table 4-2). The group would be larger if those involving Operating Recommendations were included. To date, the SWG has identified five cases involving Operating Recommendations that also involve Close Clearance, bringing the total to fifteen.⁸

Table 4-2. Ten Close Clearance Fatalities Not Involving SOFA Operating Recommendations*

#	RR	Date	Location	FRA Report #
1	UP	08/04/93	Pryor, OK	FE-27-93
2	SP	04/12/94	Houston, TX	FE-12-94
3	NS	12/11/95	Toledo, OH	FE-33-95
4	CSX	12/14/95	Monroe, NC	FE-34-95
5	NS	07/01/98	Buechel, KY	FE-19-98
6	CSX	05/22/00	Richmond, VA	FE-16-00
7	UP	07/28/00	St. Louis, MO	FE-23-00
8	PAL	10/10/01	Clayburn, KY	FE-31-01
9	NS	12/24/01	Lynchburg, VA	FE-40-01
10	NS	03/21/02	Claymont, DE	FE-09-02

‘Close Clearance’ is defined by the SWG: When an employee is passing, or being passed, by an object or equipment and the conditions are such that there is not enough room for the employee to avoid being struck. The definition is a broad one. It includes the traditional definition used by some railroads

⁸ The SWG determined that five switching fatalities involving Operating Recommendations also involved Close Clearance: FE-18-92 (Recommendation 1), FE-06-94 (Recommendation 2), FE-12-96 (Recommendation 5), FE-05-98 (Recommendation 2), and FE-29-00 (Recommendation 4). Thus, of 124 fatalities occurring from January 1992 to December 2003, 15 (12 percent) fatalities involved Close Clearance.

as the lack of sufficient “... space between objects; and on the roadway, as the lack of clearance in the absents of space between wayside objects and rolling stock, or between rolling stock on adjacent tracks.”⁹

‘Close Clearance’ for the SWG also includes fouling a track, defined as “the placement of an individual or an item of equipment in such proximity to a track that the individual or equipment could be struck by a moving train or on-track equipment, or in any case is within four feet of the field side of the near running rail.”¹⁰

FE-16-00 and FE-31-01, described below, illustrate the traditional definition of Close Clearance, i.e., dangers inherent with close or no clearance structures:

FE-16-00: A three-person road switching crew was in the process of spotting loaded coal cars at a unloading facility that was equipped with a “shaker” that helped empty each car. The shaker’s position causes a close clearance condition. The conductor was riding one side of the leading coal car and the brakeman was riding the other. Although having a clear view of the fouling equipment, the brakeman did not get off the car as the conductor had expected and was crushed between it and the fouling shaker equipment.

FE-31-01: A three-person, local freight train crew was switching a plant and had 2 engines 6 cars and a caboose when they moved over a small bridge and coupled to 5 standing cars in the storage track. The conductor made the coupling and told the engineer to pull the cars out of the track. The conductor got on the side of the trailing end of the second last car in the cut and was knocked off the car by a metal pole adjacent to the storage track. He fell between the car he was riding and the last car in the cut being pulled. He died when the lead wheels of the last car rolled over him.

As mentioned, the SWG also includes cases of fouling track in its definition of ‘Close Clearance.’ The SWG recognizes that it can justifiably be argued that cases such as FE-09-02 or FE-40-01, described below, are fouling track issues, not close clearance problems:

FE-09-02: A locomotive engineer had been dropped off at the head end of his train while the conductor was taken to the rear to check on the REM. After crossing over the ATK corridor mainline tracks, and beginning to board his locomotive, the engineer was dragged off the stairs of the locomotive and killed by a passing 110 MPH passenger train.

⁹ Christopher F. Schulte. *Railroad Track Terms*, 3rd edition, 2003. Simmons-Boardman Books, Inc., Omaha, NE.

¹⁰ 49 CFR, Part 214.7, Definitions. Revised October 2003.

FE-40-01: A conductor, engineer and conductor in training had been transported to an unattended train standing on a siding a portion of which was in a tunnel adjacent to the main track. After storing their equipment, the conductor and the conductor in training left the locomotive to release hand brakes on the train. The conductor was killed when she failed to step in between two boxcars of her train as the conductor in training had done and was subsequently struck by a passing mainline train.

There are some cases in the SWG's definition of Close Clearance that exceed expected operational conditions, such as FE-34-95:

FE-34-95: A three-person crew (engineer, conductor & conductor trainee) was called to operate a local freight train. During a switching operation at a yard, the conductor was riding nine cars down a clear track and directing the shove move by radio. When the engineer did not hear any more radio transmissions from the conductor, he stopped the move and found the conductor dead and lying beside the track he had been shoving down. Post accident investigation revealed that he had been struck by a truck trailer door positioned on a flat car standing on an adjacent track and that had been left open and swinging freely. The investigation revealed that a vandal had broken into the trailer and stolen material from it.

In the end, the SWG decided that these 10 cases shown in Table 4-2, and the five cases also involving Operating Recommendations, had one thing in common, an object or equipment was passing or being passed and the conditions were such that there was not enough room for the employee to avoid being struck. Sometimes, the condition was speed, sometimes environment (trees or brush fouling the track); but in any case, the SWG could not identify enough commonalities regarding the event, location, or even the physical act to make a one size fits all recommendation.

The SWG urges safety committees, engineering departments, and other railroad industry stakeholders to address all aspects of Close Clearances:

- Where feasible, re-engineer and/or eliminate close clearances.
- Provide safe clearance in future engineering projects.
- Mark all permanent close clearance areas with highly visible signs.
- Expand job briefings (Operating Recommendation 3) to include:
 - emphasis of dangers of equipment left fouling
 - warnings to other crews when placing oversized cars on tracks adjacent to their work
 - discussions of risks of passing trains when working near mainline

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.

Table 4-3. Eight Being-Struck-By-Mainline-Train Fatalities Not Involving SOFA Operating Recommendations*

#	RR	Date	Location	FRA Report #
1	SSW	06/07/92	Conlen Siding, TX	FE-20-92
2	CSX	04/13/93	Dwale, KY	FE-13-93
3	MNCW	07/18/97	Stamford, CT	FE-22-97
4	BNSF	12/02/97	Emporia, KS	FE-36-97
5	UP	12/28/00	Dupo, IL	FE-32-00
6	BNSF	12/29/00	Gillette, WY	FE-33-00
7	NS	12/24/01	Lynchburg, VA	FE-40-01
8	NS	03/21/02	Claymont, DE	FE-09-02

* The SWG determined that five switching fatalities involving Operating Recommendations also involved being-struck-by-mainline-trains: FE-49-93 (Recommendation 3), FE-17-96 (Recommendation 5), FE-02-01 (Recommendation 5), FE-03-01 (Recommendation 3), and FE-08-01 (Recommendation 1). Thus, of 124 fatalities occurring from January 1992 to December 2003, 13 (11 percent) fatalities involved being-struck-by-mainline-trains.

4.4 Job Briefing and Mentoring – Operating Recommendation 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:

Recommendation 3: *At the beginning of each tour of duty, all crew members will meet and discuss all safety matters and work to be accomplished. Additional briefings will be held any time work changes are made and when necessary to protect their safety during their performance of service.*

Table 4-4. Fourteen Fatalities Involving SOFA Operating Recommendation 3

#	RR	Date	Location	FRA Report #
1	GBW	07/24/92	Wisconsin Rapids, WI	FE-30-92
2	IC	06/07/93	Fulton, KY	FE-23-93
3	SP	08/11/93	Tracy, CA	FE-30-93
4	GC	11/13/93	Macon, GA	FE-47-93

5	SOU	12/05/93	Atlanta, GA	FE-49-93
6	CR	11/15/94	Painted Post, NY	FE-29-94
7	CR	02/17/95	St. James, OH	FE-09-95
8	NS	03/02/95	Aiken, SC	FE-12-95
9	CR	01/12/99	Port Newark, NJ	FE-01-99
10	DME	04/02/99	Waseca, MN	FE-11-99
11	UP	10/15/00	Houston, TX	FE-30-00
12	NS	01/11/01	South Fork, PA	FE-03-01
13	BNSF	06/16/02	Memphis, TN	FE-16-02
14	UP	04/11/03	Pocatello, ID	FE-11-03

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. Job Safety Briefing instructions for *various* carriers are available for review in Appendix F.

All crew members should receive training in the art of job safety briefings. The initial job safety briefing should provide detailed and specific information on all relevant activities to be performed. The training should help necessitate sufficient conversation and review between every crew member to make everyone feel comfortable about the service to be performed. When practical, a supervisor or other knowledgeable employee should be present during the entire job safety briefing and take part in it when appropriate. Every concern should be addressed to the satisfaction of each crew member. Crew members should engage in active communications sufficient to establish their mutual understanding and safely perform the service required. Successful communication among all parties is essential.

Any work changes or developments that may impact safety should be immediately addressed to everyone’s satisfaction. Any crew member observing a safety concern should safely stop all activity and thoroughly review the concern with every other crew member. Job safety briefings should offer a comfortable environment for fellow employees to discuss yard and industry switching issues where questions or concerns may exist. Crew members should be afforded the opportunity to resolve any yard and/or industry switching issues. They should seek the advice of knowledgeable and experienced crew members, or proper authority if necessary. No action should be taken until a solution is reached and then communicated to all concerned.

Further, the Working Group recommends that additional advantage be taken of its Recommendation 5 in conjunction with its additional suggested action of Train Crew Resource Management (CRM).

Recommendation 5: *Crew members with less than one year of service must have special attention paid to safety awareness, service qualifications, on-the-job training, physical plant familiarity, and overall ability to perform service safely and efficiently. Programs such as peer*

review, mentoring, and supervisory observation must be utilized to insure employees are able to perform service in a safe manner.

Table 4-5. Nineteen Fatalities Involving SOFA Operating Recommendation 5

#	RR	Date	Location	FRA Report #
1	AGC	01/30/92	Polk County, FL	FE-04-92
2	IHRC	06/02/92	Henderson, KY	FE-16-92
3	SOO	10/19/93	Leal, ND	FE-40-93
4	GC	11/13/93	Macon, GA	FE-47-93
5	PTRA	11/10/94	Houston, TX	FE-28-94
6	CR	12/06/94	Campbell Hall, NY	FE-31-94
7	CSX	10/04/95	Riverdale, IL	FE-29-95
8	BRC	03/20/96	Bedford Park, IL	FE-09-96
9	CSX	06/15/96	Charlotte, NC	FE-12-96
10	NS	07/07/96	Sidney, IN	FE-17-96
11	DGNO	09/03/96	Dallas, TX	FE-22-96
12	UP	10/07/96	Eagle Pass, TX	FE-24-96
13	MRL	10/16/97	Laurel, MT	FE-32-97
14	BNSF	06/01/98	Lubbock, TX	FE-16-98
15	NS	05/19/99	Cincinnati, OH	FE-14-99
16	AM	09/14/99	Van Buren, AR	FE-24-99
17	CSX	01/10/01	Chicago, IL	FE-02-01
18	BNSF	06/16/02	Memphis, TN	FE-16-02
19	GC	09/12/03	Dublin, GA	FE-22-03

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. Additionally, 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.

4.5 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.