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August 2005 Switching Fatality and Severe Injury Update

Since 1992, 7 Switching Fatalities occurred in August. Historically, August and November are the lowest months for Switching Fatalities. But during August there are still many risks to employees engaged in switching operations...there are always risks to employees engaged in switching operations! *pages 6-11*

6 of the August Switching Fatalities involved one or more SOFA Recommendations. And the other August Switching Fatality involved a Special Switching Hazard...a Close Clearance. *pages 9-11*

SOFA-defined Severe Injuries for January through April 2005 totaled 50 vs. 48 for the equivalent period in 2004. These Injuries to employees engaged in switching operations include the most acute...fractures, multiple traumas, and amputations. *page 14*

2005 Switching Fatality Calendar

January	February	March	April	May	June
S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S
1	1 2 3 4 5	1 2 3 4 5	1 2	1 2 3 4 5 6 7	1 2 3 4
2 3 4 5 6 7 8	6 7 8 9 10 11 12	6 7 8 9 10 11 12	3 4 5 SF 7 8 9	8 9 10 11 12 SF 14	5 6 7 8 9 10 11
9 SF 11 12 13 14 15	13 14 15 16 17 18 19	13 14 15 16 17 18 19	10 SF 12 13 14 15 16	15 16 17 18 19 20 21	12 13 14 15 16 17 18
16 17 18 19 20 21 22	20 21 22 23 24 25 26	20 21 22 23 24 25 26	17 18 19 20 21 22 23	22 23 24 25 26 27 28	19 20 21 22 23 24 25
23 24 25 SF 27 28 29	27 28	27 28 29 30 31	24 25 26 27 28 29 30	29 30 31	26 27 28 29 30
30 31					
July	August	September	October	November	December
S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S
1 2	1 2 3 4 5 6	1 2 3	1	1 2 3 4 5	1 2 3
3 4 SF 6 7 8 9	7 8 9 10 11 12 13	4 5 6 7 8 9 10	2 3 4 5 6 7 8	6 7 8 9 10 11 12	4 5 6 7 8 9 10
10 11 12 13 14 15 16	14 15 16 17 18 19 20	11 12 13 14 15 16 17	9 10 11 12 13 14 15	13 14 15 16 17 18 19	11 12 13 14 15 16 17
17 18 19 20 21 22 23	21 22 23 24 25 26 27	18 19 20 21 22 23 24	16 17 18 19 20 21 22	20 21 22 23 24 25 26	18 19 20 21 22 23 24
24 25 26 27 28 29 30	28 29 30 31	25 26 27 28 29 30	23 24 25 26 27 28 29	27 28 29 30	25 26 27 28 29 30 31
31			30 31		

The Five Lifesavers (based on SOFA Working Group Recommendations)

- Secure equipment before action is taken
- Protect employees against moving equipment
- Discuss safety at the beginning of a job or when a project changes
- Communicate before action is taken
- Mentor less experienced employees to perform service safely

Make Each Day 

Special Switching Hazards (as identified by SOFA Working Group)

- | | |
|--|--|
| <ul style="list-style-type: none"> • Close Clearances* • Free Rolling Railcars • Exposure to Mainline Trains • Tripping, Slipping, or Falling Exposures • Adverse Environmental Conditions • Shoving Movements | <ul style="list-style-type: none"> • Unsecured Cars • Unexpected Movement of Cars • Equipment Defects • Motor Vehicles or Loading Devices • Drugs and Alcohol |
|--|--|

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* The SOFA Working Group has broadened the traditional definition of 'close clearances' to include situations: "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." From *Findings and Recommendations of the SOFA Working Group: August 2004 Update*. p.48-50.

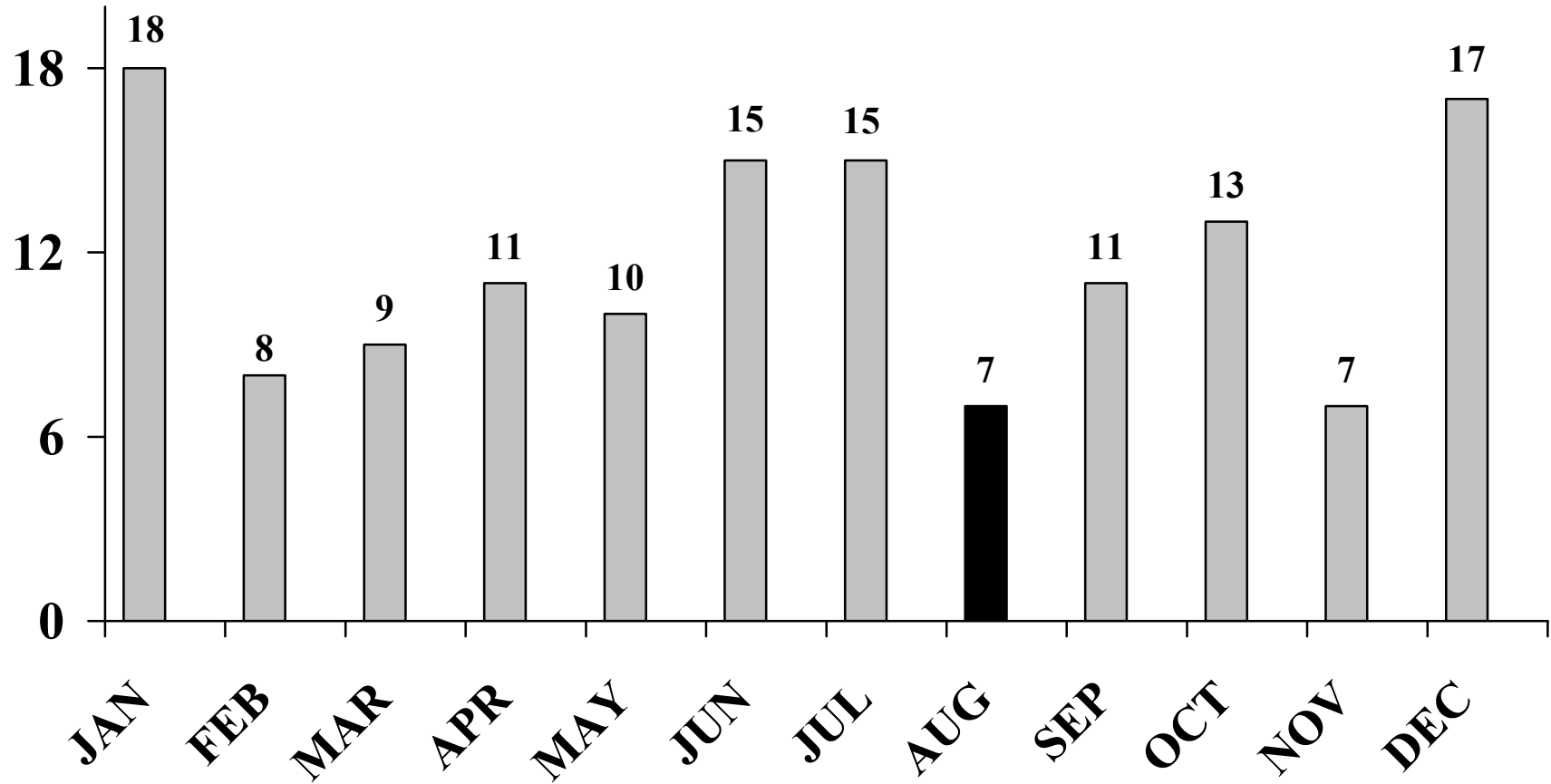
6 Switching Fatalities in 2005. Most recent July 5.

(Information on 2005 Switching Fatalities is preliminary pending formal investigation.)

- 1. JAN 10 at Buena Vista, AR...** A 53-year-old, Union Pacific (UP) conductor was struck and killed by lite engines that were running down the main track to the head end of his train, which was standing on the siding, to deliver a locomotive unit.
- 2. JAN 26 at Los Angeles, CA ...** A 52-year-old, Pacific Harbor Lines (PHL) conductor was struck and killed by his own cut of cars when he lined switches, thought the cars were going to one track, turned his back, and the cars came down the track he was fouling.
- 3. APR 06 at Selma, AL ...**A Norfolk Southern (NS) brakeman, part of a road crew, was assisting in and working with the local yard assignment in putting his train away. During a shove move, the brakeman was struck and killed by the leading end of a cut of cars the local yard assignment was moving.
- 4. APR 11 at Ogden, UT...**A Union Pacific (UP) switchman was riding on a car that was located at other than the leading end of a shove move and giving radio commands to the RCL operator who was controlling the locomotive being used to shove the cars into a track. Radio communication ceased, the move stopped and the switchman was found dead adjacent to the track being shoved.
- 5. MAY 13 at Detroit, MI...** A 24-year-old, Delray Connecting Railroad (DCRR) conductor died of injuries sustained when the car he was riding derailed. He was crushed between the car and a cement abutment.
- 6. JUL 5 at Emporia, KS...**A 26-year-old, Burlington Northern Santa Fe (BNSF) trainman, with six months experience, was crushed when the car he was riding during a shove move impacted a standing cut of cars.

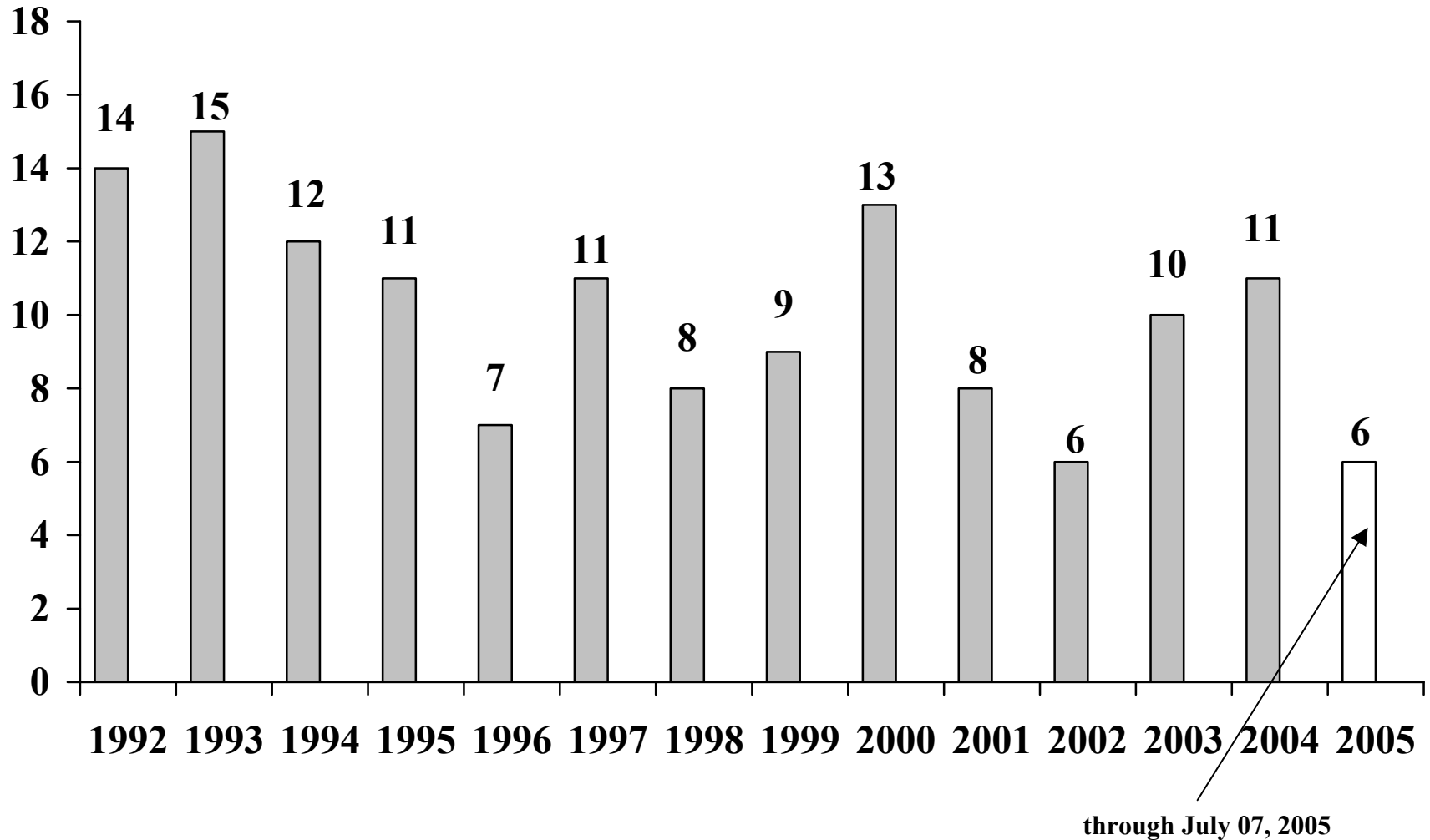
**Observing the Five SOFA Operating Recommendations and Recognizing Special Switching Hazards
Will Help Prevent Future Switching Fatalities and Achieve the Zero Switching Fatality Goal**

7 of 141 Switching Fatalities since 1992 Occurred in August



141 Switching Fatalities Since 1992

The Switching Operations Fatality Analysis (SOFA) Group reviews each Switching Fatality after the Federal Railroad Administration completes its investigation. There have been 141 fatalities since 1992. There were 11 fatalities in 2004. Six fatalities have occurred in 2005 through July 07.



10.4 Switching Fatalities occur each year on average

7 August Switching Fatalities, January 1992 through December 2004

#	Date	RR	Location	Age	Service (yrs)	Employee's Job	Employee Act	Employee Location	Fatal Event	SOFA Recommendation	Special Switching Hazard
1	08/04/93	UP	Pryor, OK	42	18	road brakemen	riding	on end of car	derailments	----	Close Clearance
2	08/11/93	SP	Tracy, CA	47	29	road brakemen	getting on	on end of car	struck by on-track equipment	3,4	----
3	08/12/93	ATSF	Evandale, TX	52	31	road brakemen	standing	on track	struck by on-track equipment	2	----
4	08/15/97	UP	Elko, NV	53	28	yard brakeman	adjusting coupler	between cars/loc	sudden/unexpected movement of on-track equipment	1	----
5	08/11/00	BNSF	Port of Los Angeles, CA	36	4	road brakemen	walking	on track	struck by on-track equipment	2	----
6	08/08/02	CWRO	Cleveland, OH	53	34	yard conductor	riding	on side of car	struck against object	2	----
7	08/26/03	LC	Chester, SC	29	4	road conductor	adjusting coupler	between cars/loc	sudden/unexpected movement of on-track equipment	1	----

The Five Lifesavers (based on SOFA Working Group Recommendations)

- **Secure equipment before action is taken.**
- **Protect employees against moving equipment.**
- **Discuss safety at the beginning of a job or when a project changes.**
- **Communicate before action is taken.**
- **Mentor less experienced employees to perform service safely.**

Narratives of the 7 August Switching Fatalities

SOFA Recommendation and/or Special Switching Hazard

1...August 04, 1993 – UP – Pryor, OK

Close Clearance

Possible Contributing Factors:

- Worn rail
- Close or no clearance
- Employee falling from moving equipment

A three-person industrial switching crew was shoving three cars down a track. The conductor was on the ground, ahead of the move and the brakeman was riding the side of the leading end of the leading car. A bush created a clearance issue and the brakeman stepped around the side of the leading car to the end of the car just as it began to derail. The brakeman was killed when he fell from the derailing car.

2...August 11, 1993 – SP – Tracy, CA

Recommendation 3 and 4

Possible Contributing Factors:

- Poor intra-crew communication about work in progress
- Hand signal, failure to comply
- Other body defects (car) (requires a description)

Crew performing industry switching. Brakeman attempted to couple air hoses while conductor gave engineer instructions to shove the movement. Resulting movement was unexpected to brakeman who was fatally injured.

3...August 12, 1993 – ATSF – Evandale, TX

Recommendation 2

Possible Contributing Factors:

- Employee on or fouling track

Upon detraining, brakeman was struck and killed by another railroad's yard job working in the same small yard. Members of both crews saw each other but the brakeman apparently did not see the short line crews shove move.

4...August 15, 1997 – UP – Elko, NV

Recommendation 1

Possible Contributing Factors:

- Failure to apply handbrakes on car(s)
- Employee on or fouling track

Crew was switching in class yard. Helper was attempting to adjust the drawbar in order to couple to three cars about forty feet away that had not coupled the first time. While adjusting the drawbar, the helper did not notice the three free-rolling cars coming back in on him and the cars coupled him up.

Narratives of 7 August Switching Fatalities (continued)

SOFA Recommendation and/or Special Switching Hazards

5...August 11, 2000 – BNSF – Port of Los Angeles, CA

Recommendation 2

Possible Contributing Factors:

- Failure to communicate unsafe condition
- Shoving movement, absence of a man on or at leading end of movement
- Employee on or fouling track
- Poor inter-crew communications

Employee was struck and killed by the lead car of another switching movement that was operating on the adjacent yard track.

6...August 08, 2002 – CWRO – Cleveland, OH

Recommendation 2

Possible Contributing Factors:

- Close or no clearance
- Failure to communicate unsafe condition
- Poor inter-crew communications

A two-person crew was switching cars in a yard and, without the trainman's knowledge, another switching crew had set cars into a track adjacent to the one being used by the first crew. The set out included a wide ladle car and it created a clearance issue on the adjacent track. Some time later, the trainman was riding the lead car down the track adjacent to the wide ladle car and was killed when he was rolled between the car he was riding and the wide ladle car sitting on the adjacent track.

7...August 26, 2003 – LC – Chester, SC

Recommendation 1

Possible Contributing Factors:

- Employee on or fouling track
- Failure to provide adequate space between equipment
- Other miscellaneous causes

A three-person crew that included a brakeman trainee was switching an industry when the conductor requested a short backup move when the cars he intended to couple to did not couple. A short time later and after failed attempts to contact the conductor the trainee discovered him dead and lying between the cars he had been trying to couple together.

.....

August Switching Fatality(s) Involving SOFA Recommendation 1

August 15, 1997

Elko, NV

August 26, 2003

Chester, SC

Recommendation 1

Any crew member intending to foul track or equipment must notify the locomotive engineer before such action can take place. The locomotive engineer must then apply locomotive or train brakes, have the reverser centered, and then confirm this action with the individual on the ground. Additionally, any crew member that intends to adjust knuckles/drawbars, or apply or remove EOT device, must insure that the cut of cars to be coupled into is separated by no less than 50 feet. Also, the person on the ground must physically inspect the cut of cars not attached to the locomotive to insure that they are completely stopped and, if necessary, a sufficient number of hand brakes must be applied to insure the cut of cars will not move.

Lifesaver 1

Secure equipment before action is taken.

Discussion 1

This recommendation emphasizes the importance of securing the equipment. A thorough understanding by all crew members that the area between cars is a hazardous location, whether equipment is moving or standing, is imperative.

August Switching Fatality(s) Involving SOFA Recommendation 2

August 12, 1993

Evandale, TX

August 11, 2000

Port of Los Angeles, CA

August 08, 2002

Cleveland, OH

Recommendation 2

When two or more train crews are simultaneously performing work in the same yard or industry tracks, extra precautions must be taken:

SAME TRACK

- Two or more crews are prohibited from switching into the same track at the same time, without establishing direct communication with all crew members involved.

ADJACENT TRACK

- Protection must be afforded when there is the possibility of movement on adjacent track(s). Each crew will arrange positive protection for (an) adjacent track(s) through positive communication with yardmaster and/or other crew members.

Lifesaver 2

Protect employees against moving equipment.

Discussion 2

FE-06-94 and FE-31-94 both involved standing equipment left by another crew. In both cases, it can be argued that there was no possibility of either piece of equipment being moved. However, the fact that both pieces of equipment contributed to the fatalities and in both cases the respective crews had no knowledge that the equipment had been moved into the work area and that the physical layout expected by each fatality had changed contributed to the incident. Compliance with and an understanding of this recommendation would have prevented the other seven fatalities.

August Switching Fatality(s) Involving SOFA Recommendation 3

August 11, 1993

Tracy, CA

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.

Lifesaver 3

Discuss safety at the beginning of a job or when a project changes.

Discussion 3

Safe switching operations require teamwork and accountability among all crew members. Each crew member takes responsibility for their own and their fellow crew member's safety. Team work begins with a detailed, effective job briefing, but includes continued updates to all crew members describing the current state of each move as it is executed.

August Switching Fatality(s) Involving SOFA Recommendation 4

August 11, 1993

Tracy, CA

Recommendation 4

When using radio communication, locomotive engineers must not begin any shove move without a specified distance from the person controlling the move. Strict compliance with "distance to go" communication must be maintained.

When controlling train or engine movements, all crew members must communicate by hand signals or radio signals. A combination of hand and radio signals is prohibited. All crew members must confirm when the mode of communication changes.

Lifesaver 4

Communicate before action is taken.

Discussion 4

The SOFA group believes that the key to radio use when backing, shoving or pushing a train or cut of cars is the communication between the locomotive engineer and the train crew. The crew must develop the discipline to remain stopped until specific car counts are given by the ground person, rather than to begin moving and then expect to receive the count. If this is done, fatalities related to improper radio communication can be substantially reduced. Additionally, mixing radio and hand signals causes confusion, reduces the chance that other members of the crew would hear of a change in the switching operations, thereby greatly increasing misunderstandings, and, has directly led to fatalities studied by the SOFA Group.

August Switching Fatality(s) Involving SOFA Recommendation 5

None

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.

Lifesaver 5

Mentor less experienced employees to perform service safely.

Discussion 5

While classroom training time has increased, in general, the SOFA group has focused on experience and on-the-job training. We have found that limited training and experience continues to factor into many switching operation fatalities. Additional on-the-job training and experience, while working with more experienced peers, may help reduce fatalities among crew members with limited service.

August Switching Fatality(s) Involving Special Switching Hazards

“In addition to the Five Operating Recommendations, the SWG (SOFA Working Group) wants to make those engaged in switching operations aware of Special Switching Hazards. In its review of each of the 124 fatalities, the SWG identified a number of fatalities involving close clearances (10 fatalities), being struck by mainline trains (8 fatalities), and occurring during shove movements (61 fatalities). The number of fatalities involving close clearance and being struck by mainline trains would be greater if those classified both as a Special Switching Hazard and an Operating Recommendation were included in these fatality counts.” - from *Findings and Recommendations of the SOFA Working Group: August 2004 Update*. p. xiv.

Pryor, OK

Close Clearances

Special Switching Hazards Identified by SOFA Working Group

- Close Clearances*
- Free Rolling Railcars
- Exposure to Mainline Trains
- Tripping, Slipping, or Falling Exposures
- Adverse Environmental Conditions
- Shoving Movements
- Unsecured Cars
- Unexpected Movement of Cars
- Equipment Defects
- Motor Vehicles or Loading Devices
- Drugs and Alcohol

* The SOFA Working Group has broadened the traditional definition of ‘close clearances’ to include situations “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.” From *Findings and Recommendations of the SOFA Working Group: August 2004 Update*. p.48-50.

Frequency of the Five SOFA Operating Recommendations and Special Switching Hazards

The SOFA Working Group (SWG) has reviewed completely 124 of the 141 Switching Fatalities occurring from January 1, 1992 through July 07, 2005. In its judgment, one or more Recommendations applied to 64 of the 124 cases – 51.6 percent. As well, in the SWG’s judgment, one or more Special Switching Hazards applied to 60 of the 124 cases – 48.4 percent.

The use of multiple Operating Recommendations indicates the complexity of the cause of some Fatalities. Often, a Switching Fatality results from not one, but several states, conditions, and actions occurring sequentially and/or simultaneously. In all, 82 Recommendations were applied to 64 of the 124 Switching Fatality cases.

Similarly, the SWG used multiple Special Switching Hazards for some Fatality cases. In all, 65 Special Switching Hazards were applied to 60 of the 124 Switching Fatality cases.

Number and Percent of Recommendations Applied to 64 Switching Fatalities by SWG

Recommendation	Applied	Percent
1	19	23.2%
2	12	14.6%
3	14	17.1%
4	18	21.9%
5	19	23.2%
total	82	100.0%

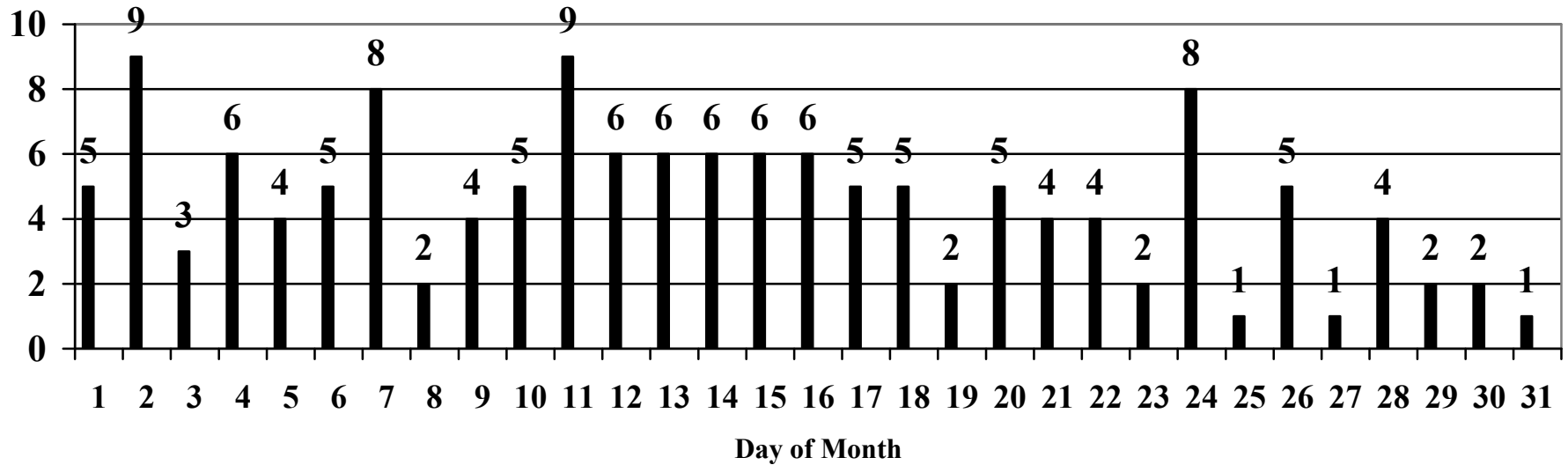
See pages 9-11 for a description of each of the Five Operating Recommendations.

Number and Percent of Special Switching Hazards Applied to 60 Switching Fatalities by SWG

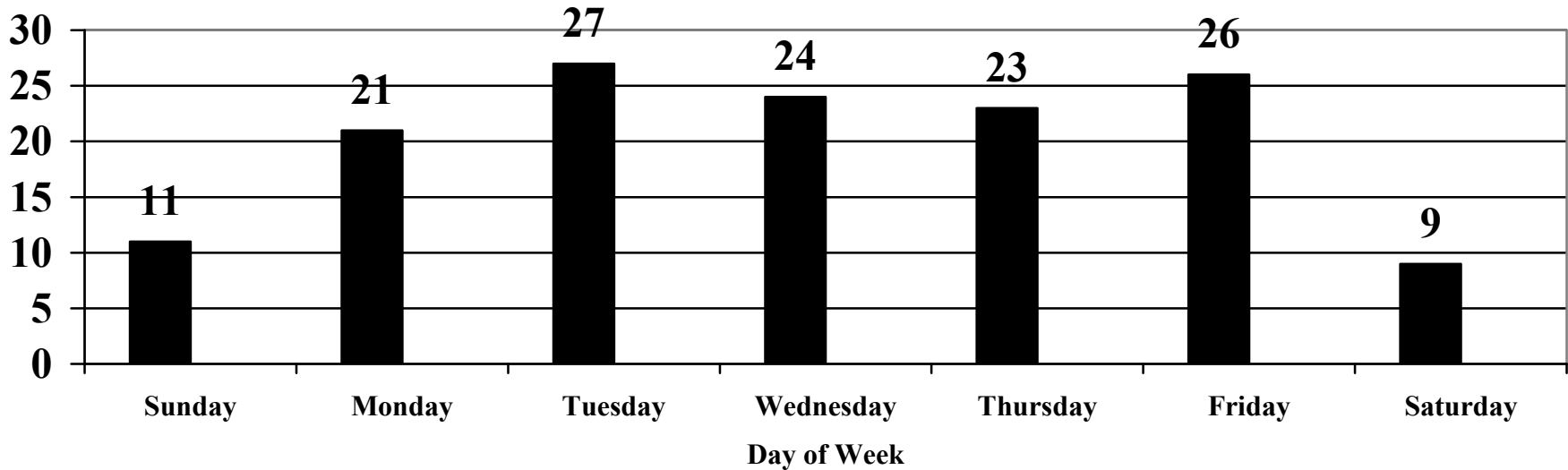
Special Switching Hazard	Applied	Percent
Close Clearance*	10	15.6%
Exposure to Mainline Trains	8	12.5%
Tripping, Slipping, or Falling Exposure	6	9.4%
Free Rolling Railcars	6	9.4%
Unsecured Cars	6	9.4%
Equipment Defects	4	6.3%
Struck by Motor Vehicle	4	6.3%
Unexpected Movement of Railcars	4	6.3%
Adverse Environmental Conditions	3	4.7%
Drugs and Alcohol	3	3.1%
Miscellaneous Switching Hazards	11	17.2%
total	65	100.0%

* The SOFA Working Group has broadened the traditional definition of ‘close clearances’ to include situations “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.” From *Findings and Recommendations of the SOFA Working Group: August 2004 Update*. p.48-50.

141 Switching Fatalities by Day of Month of Occurrence, January 01, 1992 to July 07, 2005



141 Switching Fatalities by Day of Week of Occurrence, January 01, 1992 to July 07, 2005



SOFA-defined Severe Injuries ¹

Injuries

Amputations ²

January 1992 to April 2005

	1997	1998	1999	2000	2001	2002	2003	2004	2005		1997	1998	1999	2000	2001	2002	2003	2004	2005
JAN	11	13	16	15	21	12	11	11	21		1	0	2	1	0	0	2	2	2
FEB	17	15	9	9	9	13	17	14	10		0	1	0	1	0	2	1	2	0
MAR	14	12	17	11	10	10	13	10	9		3	4	3	2	1	1	3	1	2
APR	8	10	6	10	12	6	9	13	10		1	2	0	1	2	0	1	1	2
YEAR TO DATE	50	50	48	45	52	41	50	48	50		5	7	5	5	3	3	7	6	6
MAY	6	12	8	8	12	14	9	6			1	2	3	0	2	2	2	0	
JUN	9	10	8	11	8	5	10	9			2	1	1	0	1	0	0	1	
JUL	9	14	10	8	10	7	6	10			1	5	1	0	4	0	1	2	
AUG	13	10	11	14	8	10	7	14			1	0	1	4	0	1	0	2	
SEP	10	11	15	10	20	12	5	4			2	4	3	2	5	4	0	0	
OCT	12	12	16	10	5	11	9	7			2	5	2	2	0	0	2	2	
NOV	12	9	12	11	13	14	10	10			2	2	2	2	3	0	1	1	
DEC	18	9	7	22	12	9	8	15			4	1	0	4	1	1	2	1	
totals	139	137	135	139	140	123	114	123			20	27	18	19	19	11	15	15	

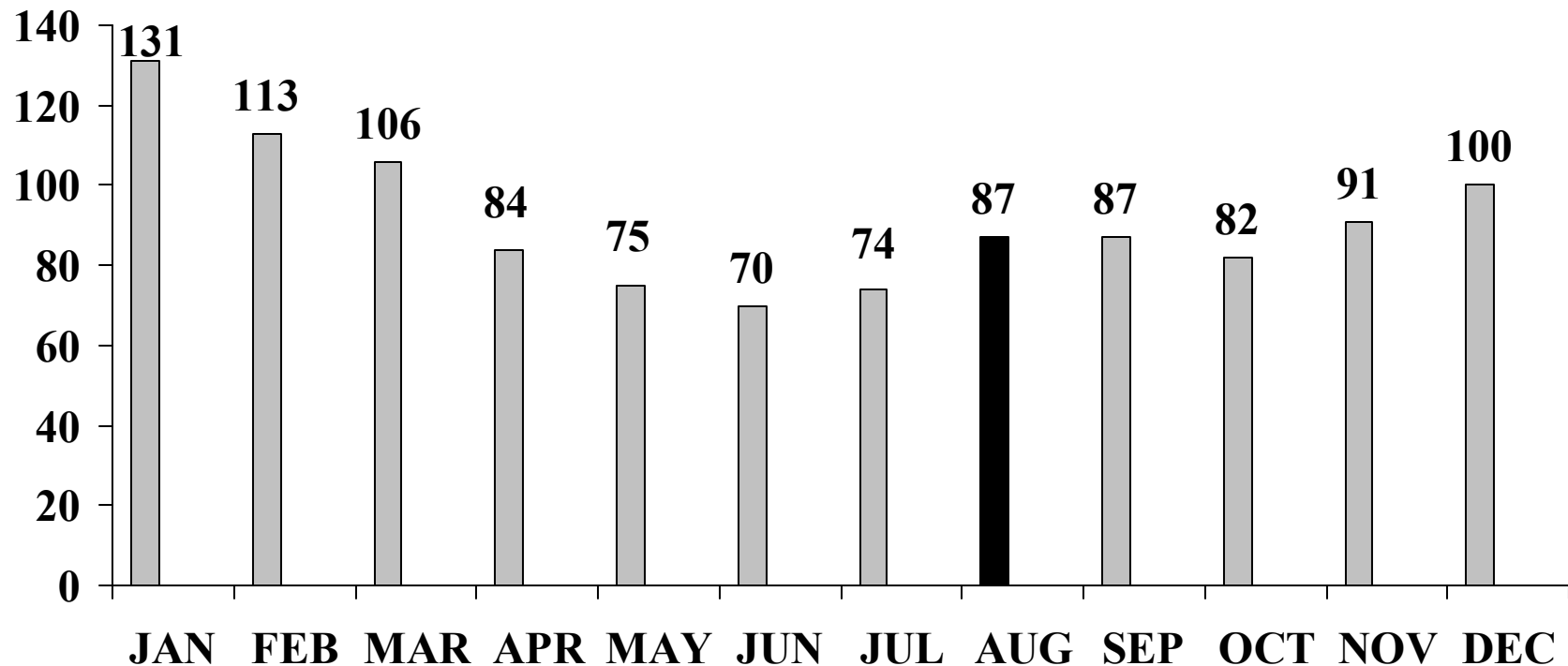
1 *Severe Injuries* were defined by the SOFA Working Group as (1) potentially life threatening; (2) high likelihood of permanent loss of function, permanent occupational limitation, or other permanent disability; (3) likely to result in significant work restrictions; and (4) result from a high-energy impact to the human body. 'Severe Injuries' include amputation, dislocation of the neck, loss of eye, electric shock or burn, and fracture to any bone except the lower arm, fingers, foot, and toes, See *Severe Injuries to Train and Engine Service Employees: Data Description and Injury Characteristics*. July 2001. This report may be found on the FRA's website.

2 Amputations are a type of SOFA-defined Severe Injury and are counted in 'Injuries'. Amputations are broken out separately because of the extreme nature of trauma to employees engaged in switching operations, and the potential for permanent occupational limitation.

87 SOFA-defined Severe Injuries (including amputations) in August since 1997

Severe Injuries were defined by the SOFA Working Group as (1) potentially life threatening; (2) high likelihood of permanent loss of function, permanent occupational limitation, or other permanent disability; (3) likely to result in significant work restrictions; and (4) result from a high-energy impact to the human body. 'Severe Injuries' include amputation, dislocation of the neck, loss of eye, electric shock or burn, and fracture to any bone except the lower arm, fingers, foot, and toes, See *Severe Injuries to Train and Engine Service Employees: Data Description and Injury Characteristics*. July 2001. This report is on the FRA's website.

(January to April represent 9 years of Severe Injuries. All other months are 8 years.)



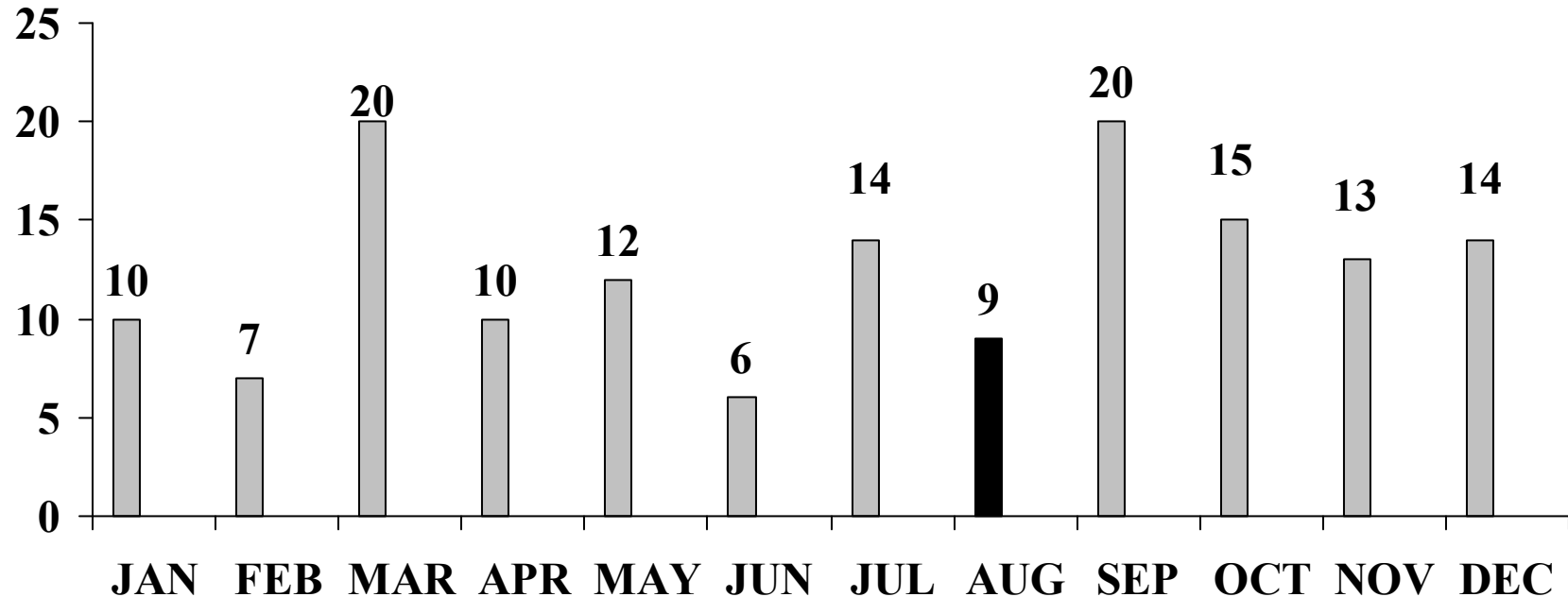
1100 Severe Injuries occurred from January 1997 through April 2005

131.3 SOFA-defined Severe Injuries occur each year on average

9 Amputations (a type of Severe Injury) in August since 1997

- Amputations are a type of SOFA-defined Severe Injury and are counted in Severe Injuries.
- Amputations are displayed separately because of the extreme nature of trauma to employees engaged in switching operations, and the potential for permanent occupational limitation.

(January to April represent 9 years of Severe Injuries. All other months are 8 years.)



150 Amputations occurred from January 1997 through April 2005

18.0 Amputations occur each year on average