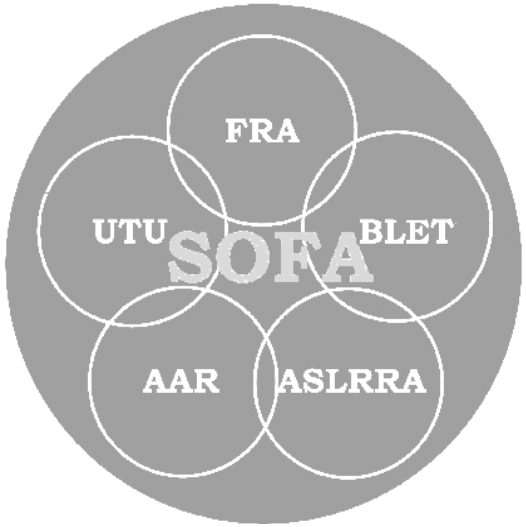
Please Post Immediately

Apply SOFA Operating Recommendations. Recognize Special Switching Hazards.



November 2005 Switching Fatality and Severe Injury Update

- Seven Switching Fatalities have occurred in November since January 1, 1992. Two Fatalities occurred on consecutive days: Farewll, TX, 11/12/93; Macon, GA, 11/13/93. Two Fatalities occurred within five days: Houston, TX, 11/10/94; Painted Post, NY, 11/15/94. *page 6*

- Nine (9) Switching Fatalities have occurred in 2005. One Fatality is believed to involve a SOFA Operating Recommendation. To achieve the Zero Switching Fatality Goal, in addition to continued application of the Five Operating Recommendations, emphasis is needed on recognizing Special Switching Hazards. *page 2*

- 67 SOFA-defined Severe Injuries have occurred in 2005 through July, the latest month available, compared to 73 Injuries in 2004 for the same seven-month period. This year's 67 Severe Injuries, along with the same number in 2002, are the lowest since 1997, the first year Severe Injuries are calculable. *page 15*

Switching Operations Fatality Analysis (SOFA)

Comprised of union, management, and government representatives, The SOFA Working Group (SWG) is trying to achieve a Zero Switching Fatality Goal through education (based on review of 124 Fatalities) of why Switching Fatalities occur. And how such Fatalities, averaging 10.5 per year, can be prevented. Historically, about half of the Switching Fatalities since January 1992 involved one or more of the Five SOFA Operating Recommendations. The remaining Fatalities involved one or more Special Switching Hazards.

Within the past two years, the mix has changed (see page 5). Now the majority of Switching Fatalities involve Special Switching Hazards. The SWG believes the industry's emphasis on the Five Operating Recommendations had a positive effect – as will continued emphasis. But to Achieve the Zero Switching Fatalities Goal, additional emphasis is needed on recognizing Special Switching Hazards.

Special Switching Hazards

- 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

SWG also monitors Severe Injuries occurring to employees engaged in switching operations. On average, each year 131.3 Severe Injuries occur. These Injuries are acute: amputations, multiple fractures, loss of eye, electric shock or burn – having a high likelihood of impacting an employee's quality of life and ability to work. SWG believes application of the Five Operating Recommendations and recognition of Special Switching Hazards can reduce Severe Injuries. However, SWG does not understand all of the causes of Severe Injuries.

* 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.

9 Switching Fatalities in 2005. Most recent August 15.

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**…An 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.

7. **JUL 18 at Memphis, TN**…An Union Pacific (UP) conductor died when the car he was riding on the point of a shove move was struck at a private crossing by a semi-tractor trailer truck at an industrial location.

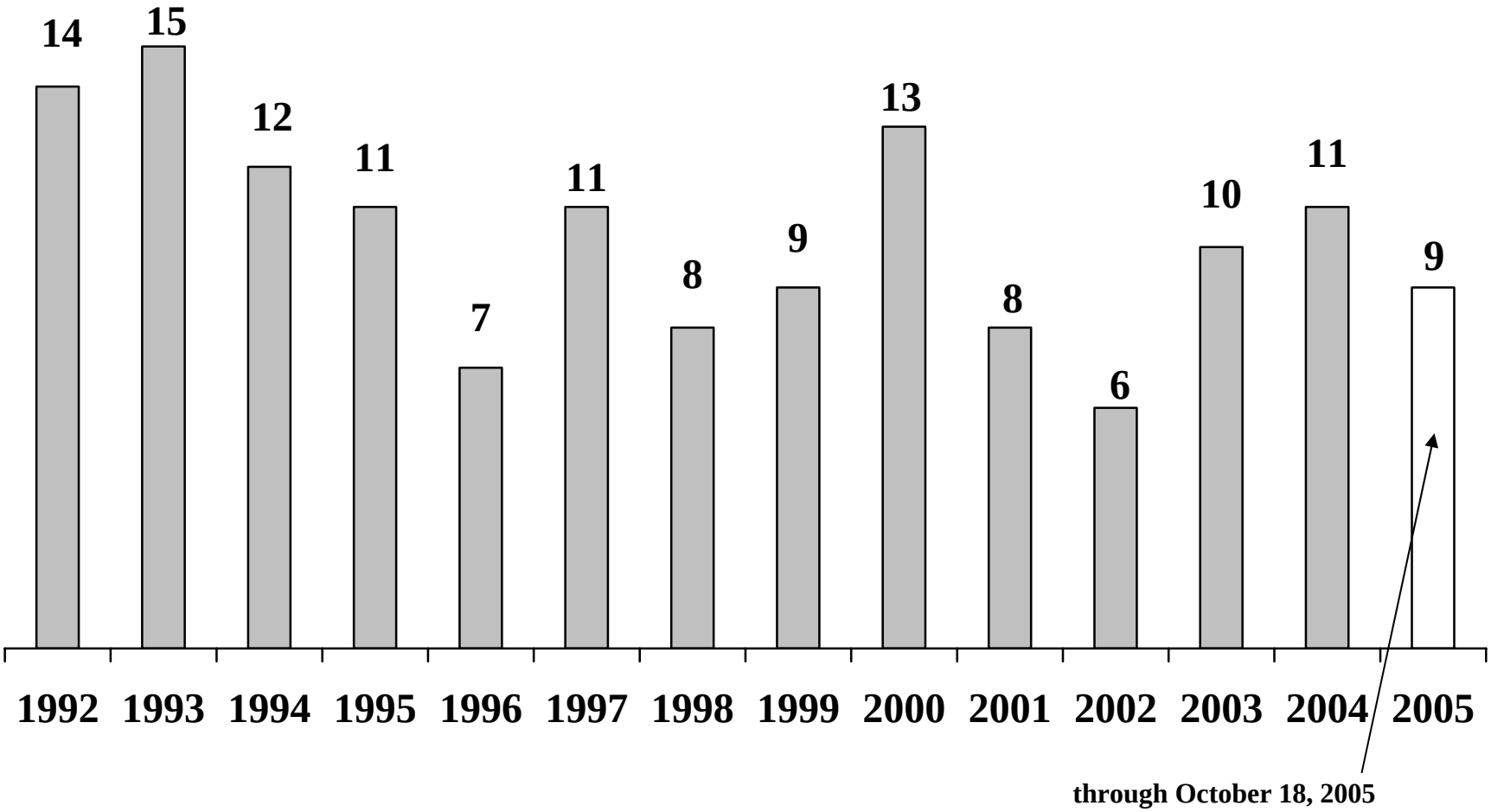
8. **JUL 22 at Ragland, AL**…An Alabama & Tennessee Railway Company conductor died when crushed against a wall when the car he was riding on the point of a shove move was derailed.

9. **AUG 15 at Rogers, AR**…An Arkansas & Missouri Railroad Company (AM) conductor died when he was standing on the ground in a plant and was crushed between a car being spotted in the plant by his engineer and brakeman. The brakeman was controlling the shove move.

Apply SOFA Operating Recommendations. Recognize Special Switching Hazards.

144 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 144 Fatalities since 1992. There were 11 Fatalities in 2004. Nine Fatalities have occurred in 2005 through October 18. The last Fatality occurred on August 15.



10.5 Switching Fatalities occur each year on average

66 of 144 (45.8%) Switching Fatalities Related to Five SOFA Operating Recommendations

- There were 47 Switching Fatalities related to the Five Operating Recommendations in the pre-SOFA Report period, January 1992 through September 1999 – 7.75 years. The original SOFA Report[1] was released in October 1999.

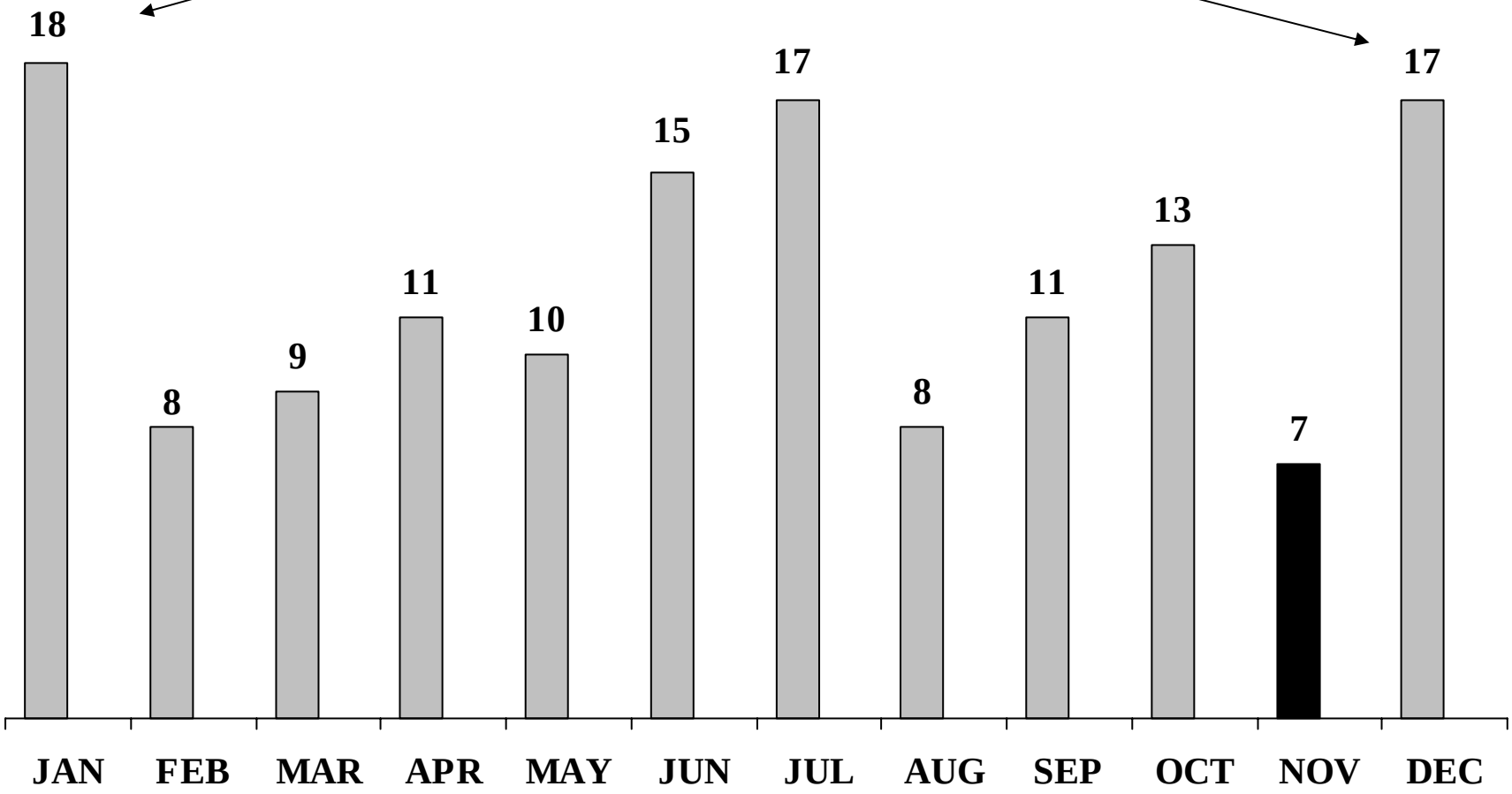
- There were 19 Switching Fatalities related to the Five Operating Recommendations in the post-SOFA Report period, October 1999 through September 2005 – 6.00 years.

- Expressed as rates per year: 6.07 fatalities per year, pre-SOFA Report v. 3.17 fatalities per year, post-SOFA Report.

[1] *Findings and Recommendations of the SOFA Working Group*. October 1999. Available at http://www.fra.dot.gov/us/content/102

7 of 144 Switching Fatalities since 1992 Occurred in November

<u>Please Note</u>: While there is always risk to employees engaged in switching operations, the upcoming months of December and January represent 24.3 percent of the 144 Switching Fatalities occurring since January 1992.



7 October Switching Fatalities, January 1992 through September 2004

#	Date	RR	Location	Age	Service (yrs)	Employee's Job	Employee Act	Employee Location	Fatal Event	SOFA Recommendations	Special Switching Hazard
1	11/16/92	TTIS	Maysville, KY	35	13	road conductor	standing	between cars/loc	collision between on-track equipment		**Miscellaneous (fell into wood chipper)**
2	11/12/93	ATSF	Farewell, TX	41	21	road conductor	riding	on side of car	struck by on-track equipment		**Unsecured Cars and Drugs and Alcohol**
3	11/13/93	GC	Macon, GA	47	1	yard conductor	standing	on track	struck by on-track equipment	**3, 5**	
4	11/10/94	PTRA	Houston, TX	31	0.5	yard brakeman	activity not witnessed	near industrial wood chipper	caught in or compressed by machinery	**5**	
5	11/15/94	CR	Painted Post, NY	57	38	road brakemen	standing	on track	struck by on-track equipment	**3, 4**	
6	11/17/99	UP	Lincoln, NE	57	35	road brakemen	walking	on track	struck by on-track equipment		**Unexpected Movement of Railcars**
7	11/01/04	BNSF	Bowdoin, MT	**Being reviewed by SOFA Working Group**							

Apply SOFA Operating Recommendations. Recognize Special Switching Hazards

No. 1 of 7 November Switching Fatalities

November 16, 1992 – TTIS – Maysville, KY
A two-person train crew was taking a coal train down a 3 percent grade and through an eight-degree curve when the train separated at the 17th head car. The cause of the separation was a broken knuckle. To remove the partially broken knuckle, the conductor decided that he had to impact the standing cars with the 17 head cars. On his third attempt, the couplers by-passed and the corners of the 18th and 17th head cars came together at the push pole pads crushing the conductor between them.

Special Switching Hazard(s):	**Miscellaneous**
Possible Contributing Factor:	Employee on or fouling track
External Circumstances:	Jammed knuckle pin
Day of Week:	Monday
Time of Fatal Event:	6:05 PM
Time on Duty (hours: minutes):	4:05
Temperature (Fahrenheit):	45
Direction of Movement:	shoved
Crew's Next Move:	replace knuckle
Death Result of Train Movement?	yes
Track Type:	main
Hit by Own Equipment?	yes
Striking Train Within Rules?	yes
Speed of Equipment (mph):	1
Deceased Regular Job?	yes
Crew Size:	2
Drugs Present?	no
Drugs a Factor?	no
Emergency Response Procedures Followed?	yes

Note: The Switching Fatality narrative summaries in this section are from *Findings and Recommendations of the SOFA Working Group: August 2004 Update*. All other information is from the SOFA Matrix, the SOFA Working Group's electronic database.

No. 2 of 7 November Switching Fatalities

November 12, 1993 – ATSF – Farewell, TX
A three-person industrial switching crew had been working together to get the switches lined and the derail off in preparation for a shove move into the plant. The conductor was on the leading end of the lead car and the brakeman was on the trailing end of the same car. The conductor was crushed by a car he had set out without setting a hand brake. The car rolled into a car he and his brakeman were riding and impairment (drugs) contributed to the fatality.

Special Switching Hazard(s):	**Unsecured Cars and Drugs and Alcohol**
Possible Contributing Factor:	Failure to apply handbrakes on car(s)
Possible Contributing Factor:	Failure to couple
External Circumstances:	Impairment of efficiency or judgment because of drugs or alcohol
Day of Week:	Friday
Time of Fatal Event:	6:40 AM
Time on Duty (hours: minutes):	5:55
Direction of Movement:	shoved
Crew's Next Move:	spot car
Death Result of Train Movement?	yes
Other Movements Nearby?	no
Track Type:	main/industrial
Hit by Own Equipment?	yes
Striking Train Within Rules?	no
Speed of Equipment (mph):	4
Crew Size:	3
Drugs Present?	yes
Drugs a Factor?	yes

No. 3 of 7 November Switching Fatalities

November 13, 1993 – GC – Macon, GA
Trainmaster became involved with crew performing switching in class yard without knowledge of the conductor who was coupling air hoses on a cut of cars. Cars were shoved without his knowledge while he was in the foul of the movement. Movement ran over conductor and killed him.

SOFA Operating Recommendation(s):	**3, 5**
Possible Contributing Factor:	Poor intra-crew communication about work in progress
Possible Contributing Factor:	Employee on or fouling track
External Circumstances:	Train master assisted crew
Day of Week:	Saturday
Time of Fatal Event:	8:30 AM
Time on Duty (hours: minutes):	0:30
Temperature (Fahrenheit):	50
Crew's Next Move:	pull another track
Death Result of Train Movement?	yes
Other Movements Nearby?	no
Track Type:	yard/flat/classification
Hit by Own Equipment?	yes
Speed of Equipment (mph):	1
Crew Size:	3
Drugs Present?	no
Drugs a Factor?	no

No. 4 of 7 November Switching Fatalities

November 10, 1994 – PTRA – Houston, TX
Yard switch crew, engineer, conductor and brakeman, spotting paper mill. FE (brakeman) instructed by conductor to de-train and stay at road crossing while he spotted track. FE found in nearby wood chip auger/conveyer system after mill crew started up the system while crew searched for missing FE. Mill crew was instructed by conductor not to start equipment until FE was located. FE was not familiar with the dangers associated with this mill process. FE had 5 months experience.

SOFA Operating Recommendation(s):	**5**
Possible Contributing Factor:	Insufficient training
Possible Contributing Factor:	Failure to follow instructions
Day of Week:	Thursday
Time of Fatal Event:	4:15 AM
Time on Duty (hours: minutes):	4:16
Temperature (Fahrenheit):	70
Track Type:	industrial/spot(load/unload)/outside
Speed of Equipment (mph):	0
Deceased Regular Job?	no
Had Deceased Worked There Before?	yes
Crew Size:	3
Drugs Present?	no
Drugs a Factor?	no
Emergency Response Procedures Followed?	yes

No. 5 of 7 November Switching Fatalities

November 15, 1994 – CR – Painted Post, NY
Crew switching in class yard failed to establish and maintain effective communications. Subsequent changes in switching line-up by the conductor resulted in trainman who was in the foul of Track 7 being struck by unexpected movement of equipment.

SOFA Operating Recommendation(s):	**3,4**
Possible Contributing Factor:	Poor intra-crew communication about work in progress
Possible Contributing Factor:	Failure to comply with restricted speed
Day of Week:	Tuesday
Time of Fatal Event:	9:35 AM
Time on Duty (hours: minutes):	1:35
Temperature (Fahrenheit):	55
Direction of Movement:	shoved
Crew's Next Move:	couple track
Death Result of Train Movement?	yes
Other Movements Nearby?	no
Track Type:	yard/classification/flat
Hit by Own Equipment?	yes
Striking Train Within Rules?	no
Speed of Equipment (mph):	6
Deceased Regular Job?	yes
Crew Size:	3
Drugs Present?	no
Drugs a Factor?	no
Emergency Response Procedures Followed?	yes

No. 6 of 7 November Switching Fatalities

November 17, 1999 – UP – Lincoln, NE
A three-person local switching crew had cut away from their train on the main track and proceeded to pull by the switch providing access to a clear track. The brakeman was at the switch and the conductor had removed the derail from the clear track and was awaiting the shove move at the point where the cut would be made. Meanwhile, the brakeman, who was to have gotten the switch from the main to the clear track, was walking between the gauge of the mainline track toward the remaining portion of his train. The conductor saw the cars being shoved toward the remaining portion of his train and shouted to the brakeman and then to the engineer to stop. The brakeman with his back to the move was hit and run over by the leading car of the shove.

Special Switching Hazard(s):	**Unexp. Movement of Railcars**
Possible Contributing Factor:	Employee on or fouling track
Possible Contributing Factor:	Switch improperly lined
Possible Contributing Factor:	Employee physical condition, other
External Circumstances:	Other extreme environmental condition
Day of Week:	Wednesday
Time of Fatal Event:	12:40 PM
Time on Duty (hours: minutes):	5:40
Temperature (Fahrenheit):	65
Direction of Movement:	shoved
Crew's Next Move:	make joint
Death Result of Train Movement?	yes
Other Movements Nearby?	no
Track Type:	main
Hit by Own Equipment?	yes
Striking Train Within Rules?	yes
Speed of Equipment (mph):	7
Deceased Regular Job?	yes
Crew Size:	3
Drugs Present?	no
Drugs a Factor?	no

Emergency Response Procedures Followed? yes

No. 7 of 7 November Switching Fatalities

November 1, 2004 – BNSF – Bowdoin, MT
(*Information preliminary pending review by SOFA Working Group*.)
47-year-old Burlington Northern Santa Fe (BNSF) conductor killed when struck by a passing train, he was positioning himself to observe, in Bowdoin, MT.

Apply SOFA Operating Recommendations. Recognize Special Switching Hazards.

November Fatalities 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.

Maysville, KY	Miscellaneous (fell into industrial wood chipper)
Farewell, TX	Unsecured Cars and Drugs and Alcohol
Lincoln, NE	Unexpected Movement of Railcars

Recognize Special Switching Hazards

- 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.

– from *Findings and Recommendations of the SOFA Working Group: August 2004 Update*. Available at: http://www.fra.dot.gov/us/content/102

Special Switching Hazards

The percentages of Special Switching Hazards are based on the SOFA Working Group's review of 124 Switching Fatalities occurring from January 1, 1992 to December 31, 2003. Since 2003, twenty (20) additional Switching Fatalities have occurred. Eighteen (18) of these Fatalities are believed to involve Special Switching Fatalities.

SOFA Recommendations, particularly 3 and 5, may help in avoiding Special Switching Hazards. But to do so, recognition of each Special Switching Hazard type is needed.

Special Switching Hazard Type	Percent of All Special Switching Hazards	Percent of All Switching Fatalities
Close Clearance	15.4%	8.1%
Struck by Mainline Trains	12.3%	6.5%
Employee Tripping, Slipping, Falling	9.2%	4.8%
Free Rolling Railcars	9.2%	4.8%
Unsecured Cars	9.2%	4.8%
Equipment	6.2%	3.2%
Struck by Motor Vehicle or Loading Device	6.2%	3.2%
Unexpected Movement of Railcars	6.2%	3.2%
Environment	4.6%	2.4%
Drugs and Alcohol	4.6%	2.4%
Miscellaneous	16.9%	8.9%
total	**100.0%**	**52.4%**

Recognize Special Switching Hazard

Special Switching Hazards

Material below commenting on some Special Switching Hazards taken from *Findings and Recommendations of the SOFA Working Group: August 2004 Update.* Available at: http://www.fra.dot.gov/us/content/102

Shoving

"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." - page 54

Struck by Mainline Trains

"Other than general vigilance, awareness, and alertness to the switching environment, it is difficult to prescribe a preventive measure." - page 51

Close Clearance

'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 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.

" '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." - pages 48-49

"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" - page 50

SOFA-defined Severe Injuries [1]

Injuries

	1997	1998	1999	2000	2001	2002	2003	2004	2005
JAN	11	13	16	15	21	12	11	11	21
FEB	17	15	9	9	9	13	17	14	11
MAR	14	12	17	11	10	10	13	10	9
APR	8	10	6	10	12	6	9	13	10
MAY	6	12	8	8	12	14	9	6	4
JUN	9	10	8	11	8	5	10	9	7
JUL	9	14	10	8	10	7	6	10	5
YEAR-TO-DATE	**74**	**86**	**74**	**72**	**82**	**67**	**75**	**73**	**67**
AUG	13	10	11	14	8	10	7	14	
SEP	10	11	15	10	20	12	5	4	
OCT	12	12	16	10	5	11	9	7	
NOV	12	9	12	11	13	14	10	10	
DEC	18	9	7	22	12	9	8	15	
totals	**139**	**137**	**135**	**139**	**140**	**123**	**114**	**123**	

Amputations [2]

1997	1998	1999	2000	2001	2002	2003	2004	2005
1	0	2	1	0	0	2	2	2
0	1	0	1	0	2	1	2	0
3	4	3	2	1	1	3	1	2
1	2	0	1	2	0	1	1	2
1	2	3	0	2	2	2	0	0
2	1	1	0	1	0	0	1	0
1	5	1	0	4	0	1	2	1
9	**15**	**10**	**5**	**10**	**5**	**10**	**9**	**7**
1	0	1	4	0	1	0	2	
2	4	3	2	5	4	0	0	
2	5	2	2	0	0	2	2	
2	2	2	2	3	0	1	1	
4	1	0	4	1	1	2	1	
20	**27**	**18**	**19**	**19**	**11**	**15**	**15**	

January 1992 to July 2005

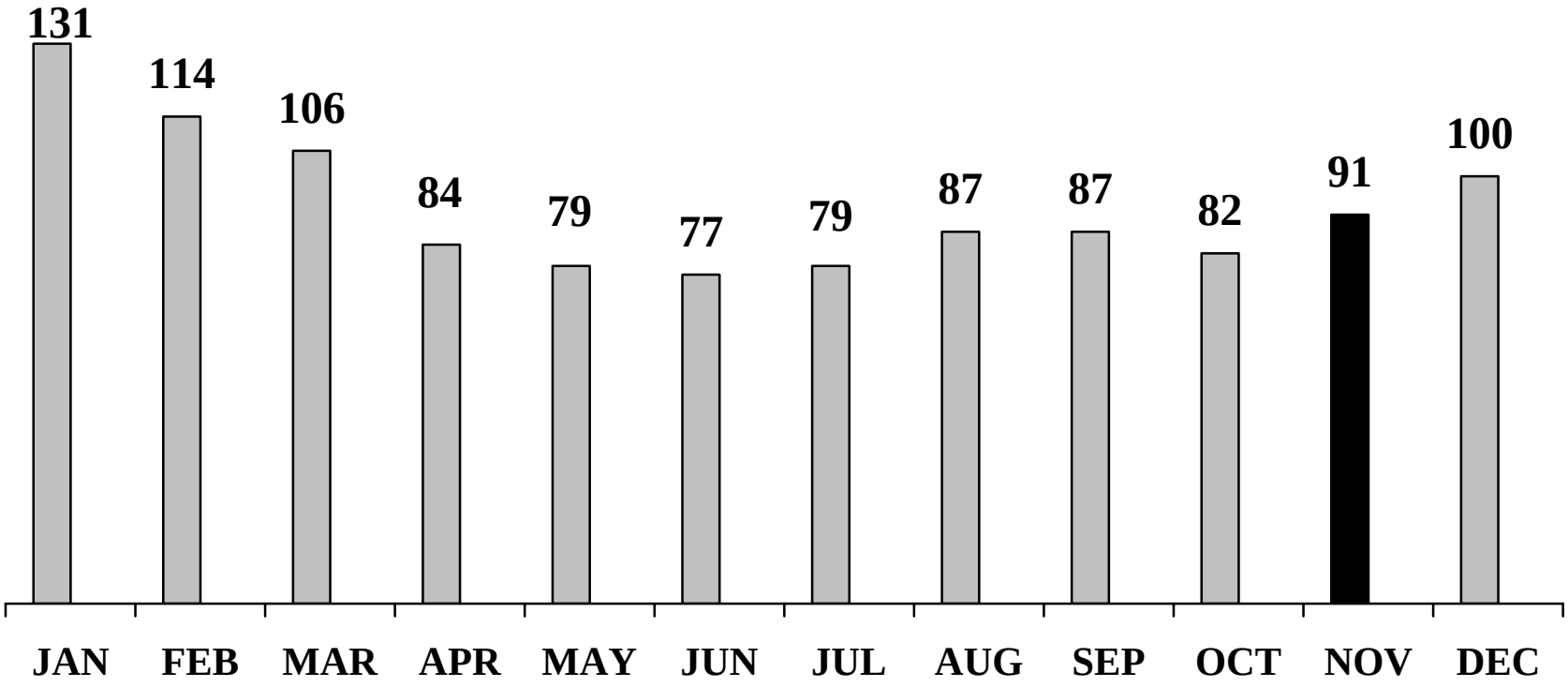
[1] *Severe Injuries* were defined by the SOFA Working Group as (1) potentially life threatening; (2) high likelihood of permanent loss of function, permanent occupational limitation, or other permanent disability; (3) likely to result in significant work restrictions; and (4) result from a high-energy 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.

91 SOFA-defined Severe Injuries (including amputations) in November 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 in on the FRA's website.

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



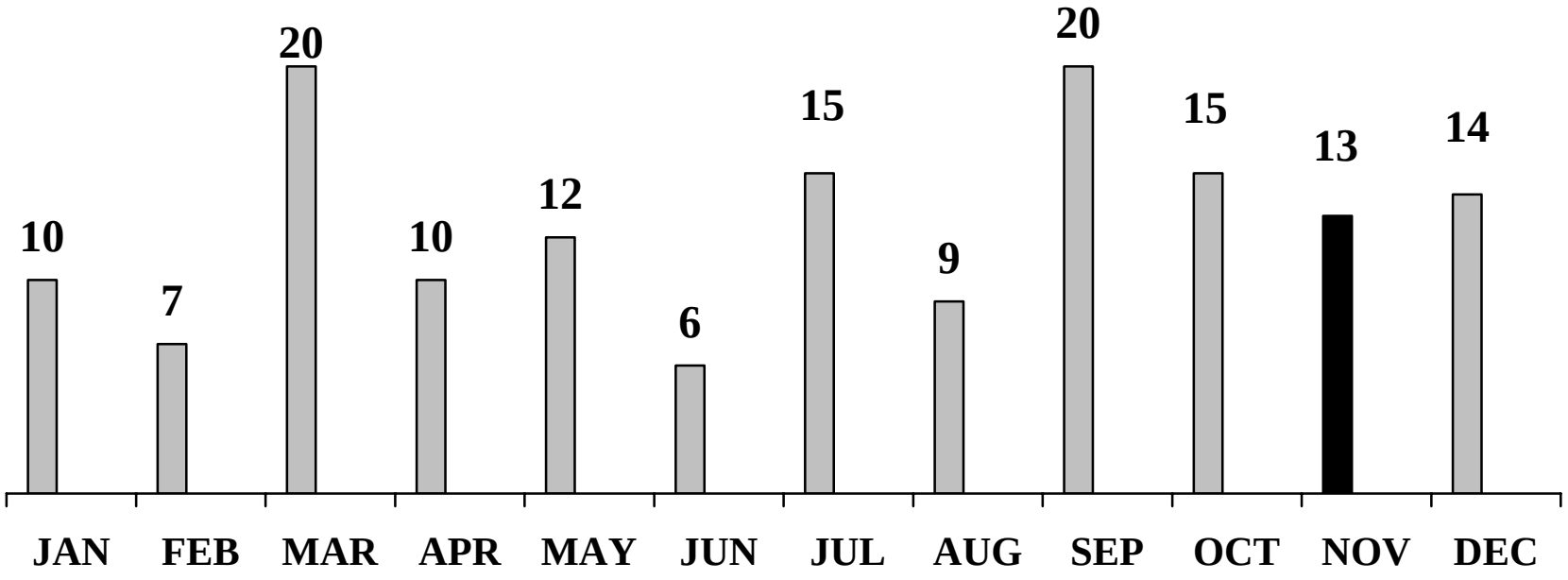
1,117 Severe Injuries occurred from January 1997 through July 2005

131.3 SOFA-defined Severe Injuries occur each year on average

13 Amputations (a type of Severe Injury) in November 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 likelihood of occupational limitations.**

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



151 Amputations occurred from January 1997 through July 2005

18.0 Amputations occur each year on average