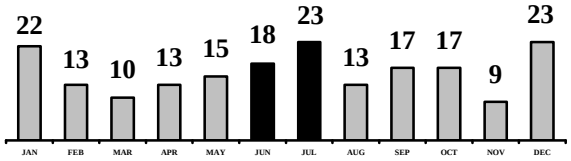
PLEASE POST IMMEDIATELY

SOFA Advisories and Lifesavers/Recommendations: Review for Summer Safety

June and July are Historically High Months for Switching Fatalities
193 Switching Fatalities, by month
January 1, 1992 through June 5, 2012



STAY ALERT THIS SUMMER
page 5

7 SOFA Safety Discussion Items

Discuss these items anytime switching safety is addressed: safety briefings, meetings…even informal conversations

***Discussion item*: How can the SOFA message – of why Fatalities occur and how such Fatalities can be prevented – be conveyed in a positive manner? As by education and cooperation among stakeholders.**

more discussion items, page 13

Tips on Conveying the SOFA Message in an Effective Way
page 6

SOFA Education Section
20 cases involving shoving as direction of movement
pages 22-26

SOFA is a voluntary, non-regulatory, railroad-safety partnership comprised of representatives from AAR, ASLRRA, BLET, FRA, and UTU
SOFA seeks to prevent switching Fatalities through education based on facts about causes. SWG is not part of a rulemaking or regulatory process
SOFA recognizes that all have responsibility for switching safety: employees, managers, and regulators
SOFA's vision is Zero Switching Fatalities achieved through education and non-punitive interactions among stakeholders

Two Switching Fatalities in 2012
through June 05
Jan 30……..Gary, IN
May 28…… Kenmare, ND
preliminary summaries, page 2

Switching Fatality History

- **Two Fatalities in 2012 through June 05, compared to one Fatality in 2011 for the same approximate five-month period. (The four total Fatalities in 2011 were historically the lowest number at least back to 1975)**
- **Since 1992, Fatalities averaged 3.9 for this five-month period, with a range of 0 to 7 Fatalities**
- **SOFA Advisories and Lifesavers can help reduce risk because the operating advice is based on why actual Fatalities occurred**

page 4

SOFA-defined Severe Injury Update

- **16 Severe Injuries in January through March 2012 compared to 22 in 2011**
- **No Amputations in January through March 2012 compared to 4 in 2011**

pages 18-21

Age of Employee for Switching Fatalities and SOFA-defined Severe Injuries
page 15

Switching Fatality and Severe Injury Update – 2012 Second Quarter

Two Switching Fatalities in 2012 through June 05

Preliminary summary, not based on investigation

1) January 30 – GRW – Gary, IN

About 6 pm, a three person switching crew (conventional—not RCL) was making a move in an industry with a cut of cars and using two tracks (#2 & 2.5). They shoved 19 East into TK2. The "helper" trainman was watching the cut – protecting the move from the east end. A cut was made and the engine, a slug unit and 4 cars came west out of TK 2 to clear. The switch was then lined for TK 2.5 by the foreman, he mounted the North side of the move (nearest the cars on TK2) and began to shove east down TK2.5. The foreman was killed when his shove came into contact with the cut left on the West end of TK2 – where it merges with TK2.5. Foreman was in his late 50's and had 10 or so years of seniority. Crew was familiar with the industry site, and had been there the night before making a similar move.

Comment based on preliminary information: Shoving was the direction of movement. Shoving involves special challenges to employees engaged in switching (see *page 3* and *pages 22-26*).

2) May 28 – CP – Kenmare, ND

A conductor and engineer of a westward CP Rwy train were in the process of setting off 27 cars into track 2 of a small yard at 2:05 a.m. local time. They had left the remainder of their train on the main track near the west end of the yard. After appropriate switches were lined, and as the conductor – who was riding the point of the leading car – began moving into track 2, he was struck and killed by cars out to foul on track 1. It is reported that the conductor had about 7 years of service with almost 6 as a MOW employee. The move was estimated to be moving at approximately 4 mph. This location is about 52 miles NW of Minot, ND.

Comment based on preliminary information: Appears related to SOFA Advisory 2 (close/no clearance), a temporary close clearance, cars left afoul. When the investigation becomes available, SOFA will review this case – as it does all switching Fatalities – and make a determination based on all the circumstances.

SOFA Advisories and Lifesavers/Recommendations: Review for Summer Safety

Shoving as Direction of Movement

Some information taken from SOFA Reports

- Based on 179 Fatalities: For cases involving train movement, 57 percent had shoving as the direction of movement. Seventy-seven (77) percent of industrial location Fatalities involved shoving. There were more Fatalities involving shoving during summer months, although it is not clear why this should be so.
- This is not to say that inappropriate shoving procedures were a cause, or even a contributing factor, of each Fatality. Clearly, that was not true. There are many reasons why Fatalities occur. But shoving is very prevalent in switching operations. Performing shove moves safely has importance.

179 Fatalities, January 1992 through December 2009

Based on *Table 4-3* of the *2011 SOFA Report, page 48*

	Conventional	**RCL**	**Without Motive Power**	**Total**
Movement				
Equipment being pulled	38	1		39
Equipment being shoved	93	7		100
Equipment free running	3	2	31	36
Not applicable *			4	4
Total	134	10	35	**179**

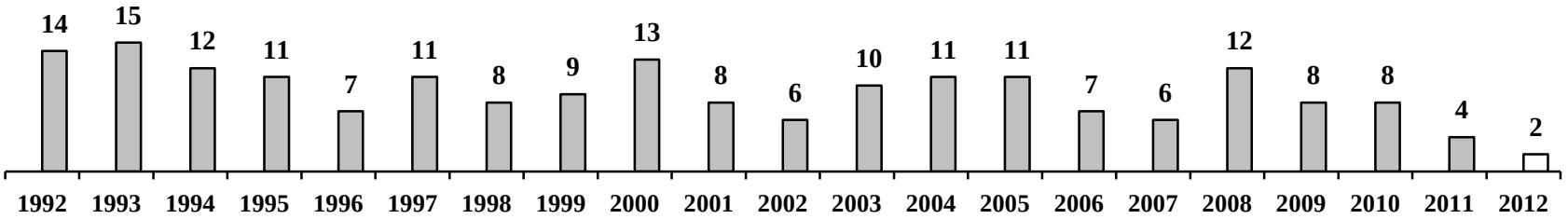
* In four cases, the deceased encountered an industrial hazard while walking and was not struck by train equipment.

- Based on possible contributing factors (PCFs) for 179 Fatalities: 24 cases involved 'Shoving movement, man on or at leading end of movement, failure to control (H307)'; 8 cases involved 'Shoving movement, absence of man on or at leading end of movement (H306)'; 2 cases involved 'Car(s) shoved out and left out of clear (H301)'; and 1 case involved 'Failure to stretch cars before shoving (H309)'. To summarize, in the 175 cases involving train movement, 20 percent involved shoving as a PCF.
- "Wherever feasible, efforts should be made to avoid shove movements especially where light engines are involved. Greater use of procedures such as running around cars and changing ends should be utilized." *2004 SOFA Report, section 4.5, page 54*. Also cited in the *2011 SOFA Report, section 1.2.6.3, page 5*.
- SOFA Advisory 3 deals with industrial hazards. Relevant to shoving, this Advisory states: "Employees engaged in switching operations must not ride railroad equipment through a grade crossing during a shove movement." *2011 SOFA Report, section 3.6.5, page 37*.
- Inexperience employees may find shove movements particularly challenging.

Always a good idea to review shoving procedures, as in safety and job briefings, and OJT and classroom training. Review both railroad and SOFA information, some of which is contained in SOFA Advisories and Lifesavers/Recommendations.

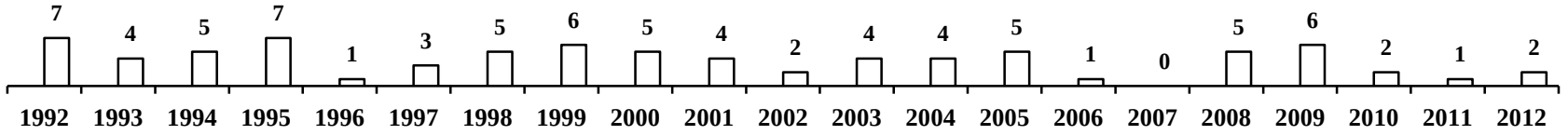
Switching Fatality History

193 Fatalities, by year: 1992 through 2011 full year; 2012, part year through June 05

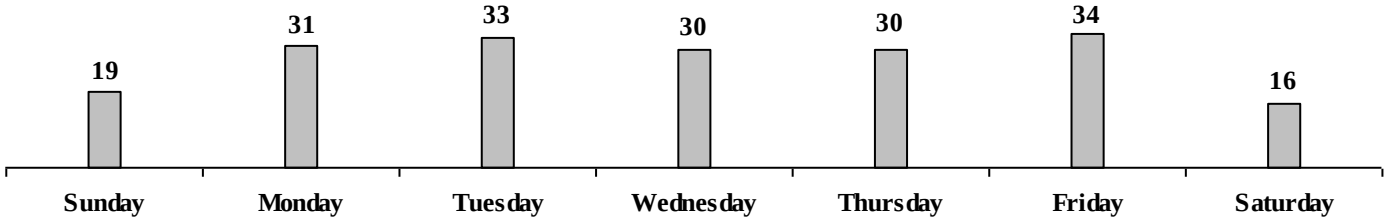


Fatalities through June 05, by year, 1992 through 2012

Fatalities averaged 3.9 for this approximate five-month period, with a range of 0 to 7 Fatalities



193 Fatalities by day-of-week, January 01, 1997 through June 05, 2012

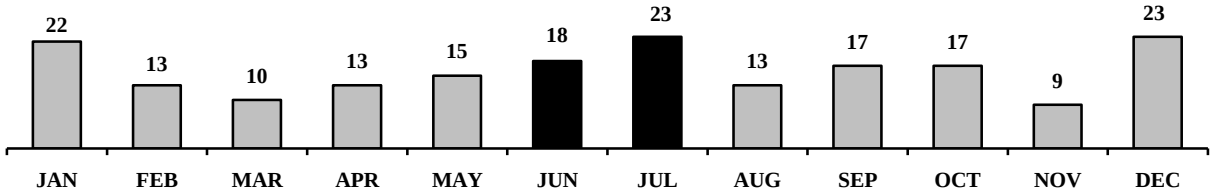


Even though occurrence is lower on Saturdays and Sundays…always apply safe operating practices

Switching Fatalities in Summer Months

193 Fatalities, by month: 1992 through 2011 full year; 2012, part year through June 05

June and July are historically high months for Fatalities



Heat Exhaustion

Taken from the *2011 SOFA Report, Vol. II, pages H6-H7*

- **Heat exhaustion occurs when bodies are unable to compensate and properly cool themselves. The symptoms of heat exhaustion include: headache, heavy sweating, intense thirst, dizziness, fatigue, loss of coordination, nausea, impaired judgment, loss of appetite, hyperventilation, tingling in hands or feet, anxiety, cool moist skin, weak and rapid pulse (120-200), and low to normal blood pressure.**

- **Impaired judgment is one of the symptoms of heat exhaustion and can be deadly in a railroad switching environment. It may be possible [that] heat exhaustion can creep up on an employee because he or she can continue on with duties without realizing judgment, concentration, and reaction time may be deteriorating. Employees may not recognize the early symptoms of heat exhaustion or be unwilling to express their concerns to peers who continue to work.**

- **Employees should not continue work if their judgment, concentration, or reaction time is impaired.**

- **Make hot weather an issue upcoming safety awareness campaigns. Increasing workforce awareness of this problem could be an important step in reducing fatalities in hot weather during the summer. Since many fatalities occur right at the beginning of summer, get an early start with a weather awareness campaign. Emphasize the increase risk on industrial properties and shove moves. [Note: these types of Fatalities are more frequent in summer months.] Educate the workforce on how to prevent heat exhaustion, how to recognize the symptoms, and what to do if it occurs.**

Tips on Conveying the SOFA Message in an Effective Way

Message content: **The SOFA message concerns <u>why</u> Switching Fatalities occur and <u>how</u> such Fatalities can be prevented.**

Many Fatalities can be prevented by incorporating the Five Advisories and Five Lifesavers/Recommendations into operating practice at times appropriate to the work being performed. As an example, Advisory 5 stresses that employees must use job briefing procedures *before* dismounting the locomotive or doing work along mainline track to establish a safe method for performing their work. (Advisory 5 also involves other safety procedures when working along mainline track.) Note the emphasis on *before*. There is no 'do-over' once harm has resulted.

But the Advisories and Lifesavers/Recommendations cannot prevent all Fatalities. General operating practice, monitoring work in progress, communication among crewmembers, knowledge of local conditions – all have importance in managing switching risk. As do other safety procedures.

Goal: **The message is straightforward. Zero Switching Fatalities. One Fatality is one too many.**

Cooperation among stakeholders: **The SOFA message involves a cooperative effort among labor, management, and FRA. It is doubtful that the full potential to save lives can be achieved in any other way. All stakeholders have responsibilities.**

Local conditions: **Relate the message to situations on your railroad. And what responsibilities and roles are involved for each stakeholder.**

Staying positive: **The SOFA message should be conveyed in a positive manner, involving education and cooperation.**

The Five SOFA Advisories: Review for Summer Safety

Consult the *2011 SOFA Report* for a full discussion on each Advisory. Particularly Chapter 3. Available at the SOFA website (click on the 'Findings and Advisories' tab in upper left corner): http://www.fra.dot.gov/Pages/1781.shtml

Advisory 1: Inexperienced Employee (also SOFA Lifesaver/Recommendation 5) – section 3.3.4 of *2011 SOFA Report*

Since the 1999 Report, the SWG [SOFA Working Group] emphasis on mentoring has not achieved a substantial reduction in SOFA 5 fatalities. It is critical for the railroad industry to provide the inexperienced employee adequate OJT [on-the-job training]. Without abandoning the commitment to mentoring, the railroad industry should improve OJT to include targeted training for the inexperienced employee. Providing follow-up review of skills, and targeted training by the railroad industry enables an inexperienced employee to meet the demands of the job. Benefits may result from a review of OJT, and improved follow-up with inexperienced employees.

If experienced, share your knowledge. If inexperienced, or not familiar with a site, speak up and ask. Admitting lack of knowledge makes you smart and protects you and crewmembers. On-the-job training for inexperienced employees, along with other ways to gain knowledge before harm results, are critical.

Advisory 2: Close Clearances – section 3.5.6 of *2011 SOFA Report*

The SWG reemphasizes that removing the hazard is the best way to address close/no clearances. Yet, in many cases a railroad or industry will not be able to eliminate the close/no clearance condition. At the minimum, the SWG believes that proper signage should be implemented and be instructive to the employee. Additionally, the sign should be an appropriate distance from the close/no clearance location and on the same side. Signage must: (a) announce the clearance issue and (b) instruct the employee who is controlling the movement to dismount and remain dismounted from the equipment while passing the close/no clearance location. One method to determine the signage design, appropriate distance, and position may be to organize a management-labor working group.

As mentioned, for permanent, the best remedy is removal. Otherwise provide appropriate signage. Report close/no clearances through established procedures. Use a job briefing to discuss close/no clearances, both permanent and temporary. When switching, be aware of the situation and surroundings.

The Five SOFA Advisories: Review for Summer Safety (continued)

Advisory 3: Industrial Hazards – section 3.6.5 of *2011 SOFA Report*
Railroads and industries need to have Industry Track Agreements, practices, or policies in place, and these should contain oversight and enforcement of the safety provisions. Railroads must provide employees with the tools and/or assistance to allow them to safely perform their work while within an industry.

Employees need to be empowered to make a decision to stop work when an unsafe condition presents itself. Employees engaged in switching operations must not ride railroad equipment through a grade crossing during a shove movement. Industries need to educate and instruct all vehicle operators concerning separation between their vehicle and railroad equipment by being attentive to movements in the industry. At the minimum, the SWG believes that proper education and instruction should be implemented by the industry. Additionally, signage and lighting should be appropriate for the crossing protection needed. Railroad managers must be educated to encourage employees to make a good faith effort to identify and report hazards at industries. Employees making a good faith effort to identify and report hazards will not be subject to discipline, discrimination, or harassment for doing so.

Report hazards through established channels and procedures. If conditions at an industry change, make others aware. Brief employees who have never, or recently, switched the site. Employees should stop work when hazards present danger. Safety, not task completion, comes first.

Advisory 4: Briefings – Job or Safety (also SOFA Lifesaver/Recommendation 3) – section 3.3.5 of *2011 SOFA Report*
The SWG [SOFA Working Group] believes ongoing communication is crucial among employees during the entire time switching operations are being performed, including periods when tasks are changing or when anomalies occur. A job briefing is a two-way exchange of information to reach an understanding of the tasks being performed.

Despite considerable efforts within the railroad industry, more than half of SOFA 3 fatalities in yards and industrial properties occurred when a job task changed and an update to the job briefing did not occur. The SWG believes more progress can be made in the area of work changes. When work changes occur, the employees involved may not maintain currency with these changes; thus, they may be unaware of the tasks to be performed, and this may place them in peril. The railroad industry must remain vigilant regarding fatalities, and when work changes occur, employees must regroup, take appropriate steps to provide protection, and not proceed until an update to the job briefing is done.

The Five SOFA Advisories: Review for Summer Safety (continued)

Job brief any time the nature of work changes from what was planned or anticipated. Constant monitoring of work in progress, and constant communication among all crewmembers, are two good ways to determine if a job briefing is needed. When briefing, two-way communication is essential. All crewmembers should feel free to speak and be understood. There is no 'one size fits all' for the content of a briefing, because a job briefing to be effective must address specific tasks and local conditions. However, at a minimum, a job briefing should include: who will act, what act is to be done, where act will occur, when act will occur, and why act is being done.

Advisory 5: Struck by Mainline Train – section 3.7.5 of *2011 SOFA Report*

The SWG reemphasizes that communication is essential to eliminating fatalities related to Struck by Mainline Trains. Fatalities occur when employees are unaware of risks associated with doing work along mainline track – particularly at times of darkness and during winter months. Therefore, the railroad industry should insist upon consistent use of multiple methods to warn employees about oncoming on-track movements. Equally, warnings should be made to the approaching on-track movement of an employee's location when a crew member is outside of the locomotive cab. In addition, the railroad industry should consider improving employee visibility when performing work on the ground.

Employees must use job briefing procedures before dismounting the locomotive or doing work along mainline track to establish a safe method for performing their work. When possible, employees must dismount to the safe side. Empower employees to establish a safe location when stopping and/or performing work when on or near mainline track. The railroad industry must support employees in the use of individual discretion as part of an effort to determine a safe location to perform work.

SOFA Advisories and Lifesavers/Recommendations: Review for Summer Safety

SOFA Lifesavers/Recommendations: Review for Summer Safety

Two of the Lifesavers/Recommendations (#3 and #5) have been updated by Advisories (respectively # 4 and #1). The reason was that Fatalities addressed by Recommendations #3 and #5 were not significantly declining. Recommendation #1 (going between rolling equipment) was also addressed by Federal Railroad Administration's *Safety Advisory 2011-02*.

Recommendation 1 (also addressed by Federal Railroad Administration's *Safety Advisory 2011-02*)

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.

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 <u>into the same track</u> 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 <u>on adjacent track(s)</u>. Each crew will arrange positive protection for (an) adjacent track(s) through positive communication with yardmaster and/or other crew members.

SOFA Lifesavers/Recommendations: Review for Summer Safety (continued)

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.

Recommendation 3 (also addressed and updated by SOFA Advisory 4)

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.

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.

SOFA Lifesavers/Recommendations: Review for Summer Safety (continued)

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.

Recommendation 5 (also addressed and updated by SOFA Advisory 1)

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.

SOFA Advisories and Lifesavers/Recommendations: Review for Summer Safety

7 SOFA Safety Discussion Items

Discuss these items anytime switching safety is addressed: safety briefings, meetings…even informal conversations. Seek a forum for these items whenever stakeholders gather to discuss switching safety

***Discussion item*: What is the best way to educate, review, and implement the Five SOFA Advisories and the Five SOFA Lifesavers/Recommendations? These measures are based on reasons why Fatalities occur and how such Fatalities can be prevented. The measures were developed from consensus agreement by labor, management, and FRA representatives based on actual Fatality cases. All engaged in switching must be aware of these measures. For the Zero Switching Fatality Goal to be achieved, the Five SOFA Advisories and the Five SOFA Lifesavers/Recommendations have to be implemented when appropriate in switching tasks. No matter how routine the switching task might first appear. And no matter how remote the switching location.**

Discussion item (mentioned on *page 1*)**: How can the SOFA message – of why Fatalities occur and how such Fatalities can be prevented – be conveyed in a positive manner? As by education and cooperation among stakeholders (labor, management, FRA). What are the obligations and responsibilities of each stakeholder to insure safe switching?** (see 'Tips on Conveying the SOFA Message in an Effective Way,' *page 6*)

***Discussion item*: The Five SOFA Advisories and the Five SOFA Lifesavers/Recommendations do not address all reasons why Fatalities have occurred. Or how future Fatalities may occur. At times these other switching hazards combine with the Advisories and Lifesavers/Recommendations to elevate switching risk. What are some other switching hazards that might lead to harm, particularly on your railroad?**

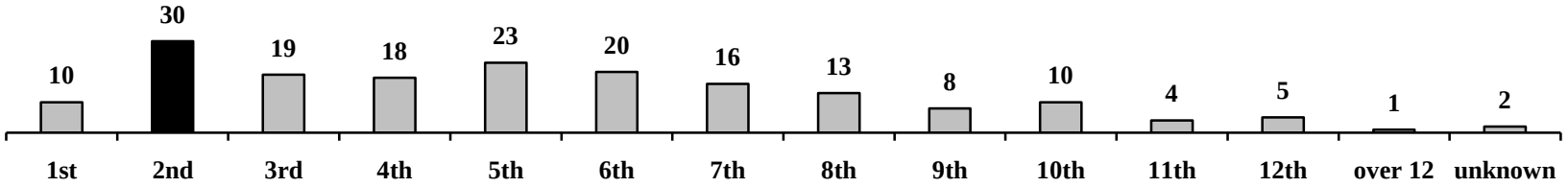
***Discussion item*: Historically, June and July have had a high occurrence of Switching Fatalities. The reasons are not altogether clear. Regardless, what are some ways to work safely this summer? Should there be a summer safety campaign on your railroad?**

***Discussion item*: SOFA Advisory 4 addresses job briefings. What is the difference between a *job* and *safety* briefing? Do you use both types in your work? And when and why?**

***Discussion item*: Thirty of the 179 Fatalities, 1992 through 2009, occurred during the second hour of duty. What types of safety campaigns, and other safety measures, would be effective in making employees aware of this elevated period of risk?** (see *page 14* for a discussion of second-hour-of-duty Fatalities)

***Discussion item*: Fatalities are not the only type of casualty that occurs to employees engaged in switching. There are Severe Injuries. And other injuries and illnesses as well. How can these other types of casualty be prevented? So that when work is done, all return home safely.**

Second-Hour-of-Duty Fatalities, 1992 through 2009



The number of Switching Fatalities during the second hour of duty is higher than any other on-duty hour. Thirty (30) of the 179 Fatalities from 1992 through 2009 occurred in the second hour of duty.

Eighteen (60 percent) of the 30 cases during the second hour of duty occurred on yard tracks. Both yard and road crews were involved. Twenty-three (77 percent) of 30 cases during the second hour of duty occurred while the deceased employee was on the ground.

The first hour of duty is generally consumed with assembling the crew, reviewing paperwork, job and safety briefings, and traveling to the work site. This second hour may correspond to the first hour a crew is actually on or about rolling stock or other equipment. And when the crew separates to begin switching operations.

Below are two examples of second-hour-of-duty Fatalities:

April 21, 2000 – Galesburg, IL – Engine Foreman – Age 60

A three person switching crew was in the process of hauling cars over the hump and the foreman of the crew was observing the move from between his track and another track that was being used by another yard job. The foreman was killed when he fouled and then was struck by a free rolling car on the adjacent track.

December 07, 2003 – San Antonio, TX – Conductor – Age 37

A pitch/catch remote control operation was being run by a single operator who was struck and killed during a yard operation by his own locomotive. He stepped in front of its movement as he was headed for the other end of a crossover switch that he intended to line for the route he intended his engine to use.

Action Item: **The industry should develop safety campaigns and other safety measures to make the workforce aware of this issue, directed towards elimination of second-hour-of-duty Fatalities.**

Above is based on the *2011 SOFA Report*, *pages 43-45*. Consult for a full discussion of second-hour-of-duty Fatalities. All 30 cases are described on *pages A-63 through A-68*

Casualty affects all ages

Age of Employee: Switching Fatalities and SOFA-defined Severe Injuries

SWITCHING FATALITIES		SOFA-defined SEVERE INJURIES
179 cases, January 1992 through December 2009		**1,522 cases, January 1997 through December 2009***
	years-old	**years-old**
average age	44.9	45.5
median age	46	48
most frequent age	55 (9 cases)	56 (77 cases)
youngest	20 (1 case)	19 (3 cases)
oldest	62 (2 cases)	69 (2 cases)
	percent	**percent**
25 years-old and older	97%	97%
30 years-old and older	90%	90%
35 years-old and older	85%	80%
40 years-old and older	70%	68%
45 years-old and older	56%	60%
50 years-old and older	37%	44%
55 years-old and older	20%	24%
60 years-old and older	4%	7%

*** 1997 is the first year these injuries can be defined based on the SOFA definition**

Switching Fatalities and SOFA-defined Severe Injuries involve casualty to employees with the FRA job description of 'Transportation, Train and Engine,' 600-series

Fatalities have occurred to employees with all lengths of service

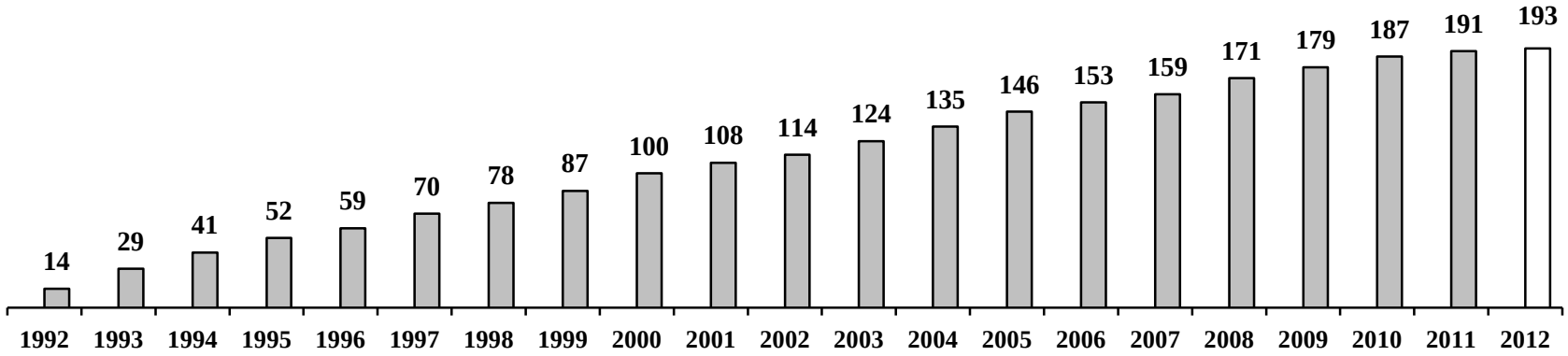
Length of Service for 179 Fatality Cases, January 1992 through December 2009

(Note: 'length of service' is not readily available for SOFA-defined Severe Injuries)

SWITCHING FATALITIES		
179 cases, January 1992 through December 2009		
		Comment
average length of service	16.5 years	
median length of service	16 years	
most frequent length of service	0.5 years (8 cases)	Represents about 6 months of service. Approximately 4 percent of the 179 Fatalities had 0.5 years of service.
least amount of service	0.06 years (1 case)	Represents about 22 days. Employee had 10 years of previous length of service. Then was inactive for another 10 years before returning to service at age 43 for approximately 22 days. SOFA classified this case as a new employee for analysis purposes.
most amount of service	40 years (1 case)	
	percent	
1 year or more	88%	
2 years or more	83%	
5 years or more	69%	
10 years or more	61%	
15 years or more	53%	For about half of the 179 Fatalities, employee had 15 years or more of service. **Length of service alone does not necessarily protect against a Fatality**.
20 years or more	46%	
25 years or more	35%	
30 years or more	20%	
35 years or more	9%	
40 years or more	1%	

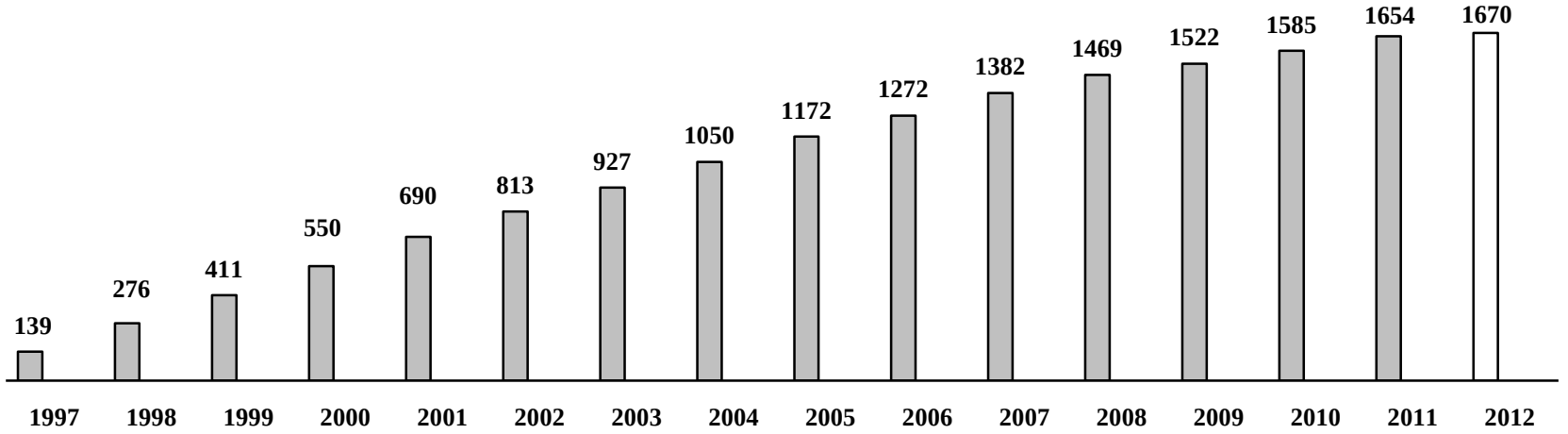
Casualty accumulates over time

193 Fatalities since 1992: 1992 through 2011 full year; 2012, part year through June 05



1,665 SOFA-defined Severe Injuries since 1997: 1997 through 2011 full year; 2012, part year through March

SOFA-defined Severe Injuries are defined only back to 1997; March 2012 is the latest month available



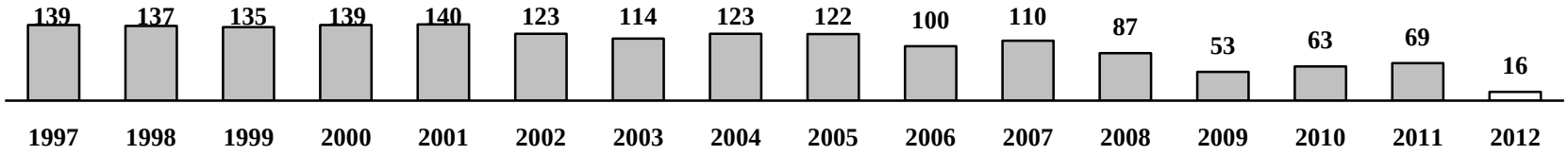
SOFA Advisories and Lifesavers/Recommendations: Review for Summer Safety

SOFA-defined Severe Injury Update

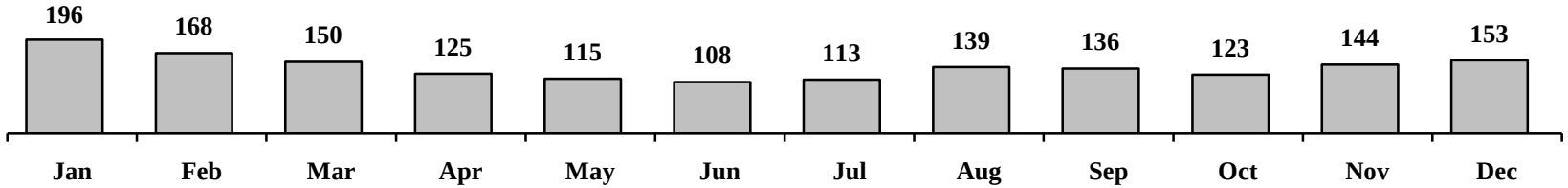
Definition: Based on its interests (i.e., potentially involving the same factors as Fatalities), *Severe Injuries* are defined by the SOFA Working Group as (1) potentially life threatening; (2) having a high likelihood of permanent loss of function, permanent occupational limitation, or other permanent disability; (3) likely to result in significant work restrictions; and (4) resulting 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. 1997 is the first year these Injuries to train and engine service employees can be determined as defined by the interest of the SOFA Working Group. For more information, see *Severe Injuries to Train and Engine Service Employees: Data Description and Injury Characteristics*. July 2001.

Note: The definition of SOFA-*defined Severe Injuries* is not to suggest that other injuries and illnesses resulting from operations are not also 'severe' and/or cause hardship to employees.

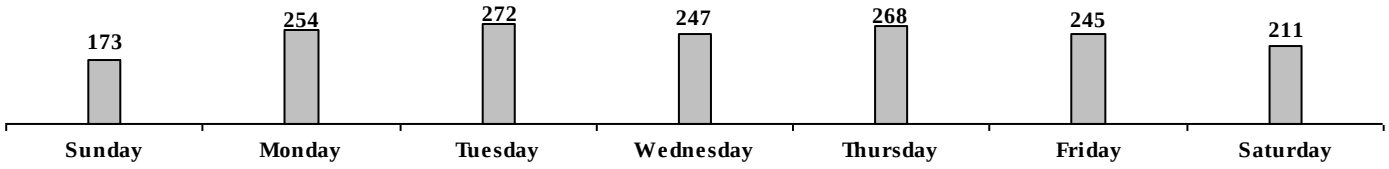
1,670 SOFA-defined Severe Injuries, 1997 through 2011 full year; 2012, part year January through March 2012



1,670 SOFA-defined Severe Injuries by month, January 1997 through March 2012



1,670 SOFA-defined Severe Injuries by day-of-week, January 1997 through March 2012



Even though occurrence is lower on Saturdays and Sundays…always apply safe operating practices

SOFA-defined Severe Injuries, by month and year, January 1997 through March 2012

Among *SOFA Updates*, counts previously presented may change based on revisions to FRA data. The latest month available from the FRA lags the calendar month of this *Update* by three months. FRA data were accessed on June 01, 2012

All Harm to Employees has Concern

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	totals	average
JAN	11	13	16	15	21	12	11	11	20	10	14	13	6	6	8	9	196	12.3
FEB	17	15	9	9	9	13	17	14	10	6	15	12	4	7	9	2	168	10.5
MAR	14	12	17	11	10	10	13	10	9	9	11	5	5	4	5	5	150	9.4
to date	**42**	**40**	**42**	**35**	**40**	**35**	**41**	**35**	**39**	**25**	**40**	**30**	**15**	**17**	**22**	**16**		**32.1**
APR	8	10	6	10	12	6	9	13	10	7	8	9	5	7	5		125	8.3
MAY	6	12	8	8	12	14	9	6	6	8	3	7	1	7	8		115	7.7
JUN	9	10	8	11	8	5	10	9	7	11	5	3	6	4	2		108	7.2
JUL	9	14	10	8	10	7	6	10	5	12	8	1	4	4	5		113	7.5
AUG	13	10	11	14	8	10	7	14	10	10	13	5	4	5	5		139	9.3
SEP	10	11	15	10	20	12	5	4	9	6	10	12	5	3	4		136	9.1
OCT	12	12	16	10	5	11	9	7	11	5	11	4	2	4	4		123	8.2
NOV	12	9	12	11	13	14	10	10	13	8	6	8	3	6	9		144	9.6
DEC	18	9	7	22	12	9	8	15	12	8	6	8	8	6	5		153	10.2
totals	**139**	**137**	**135**	**139**	**140**	**123**	**114**	**123**	**122**	**100**	**110**	**87**	**53**	**63**	**69**		**1,670**	**110.3**

Amputations (a type of Severe Injury), by month and year, January 1997 through March 2012

A type of SOFA-defined Severe Injury, Amputations are displayed separately because of the extreme trauma to employees engaged in switching, and the likelihood of permanent occupational and lifestyle limitations. Counts for Amputations are contained in the counts of SOFA-defined Severe Injuries

All Harm to Employees has Concern

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	totals	average
JAN	1	0	2	1	0	0	2	2	2	0	1	1	1	0	2	0	15	0.9
FEB	0	1	0	1	0	2	1	2	0	2	1	0	0	1	2	0	13	0.8
MAR	3	4	3	2	1	1	3	1	2	1	0	1	1	0	0	0	23	1.4
to date	**4**	**5**	**5**	**4**	**1**	**3**	**6**	**5**	**4**	**3**	**2**	**2**	**2**	**1**	**4**	**0**		**3.2**
APR	1	2	0	1	2	0	1	1	2	2	3	3	1	0	1		20	1.3
MAY	1	2	3	0	2	2	2	0	0	1	1	0	0	1	2		17	1.1
JUN	2	1	1	0	1	0	0	1	0	0	1	1	0	0	1		9	0.6
JUL	1	5	1	0	4	0	1	2	1	2	2	0	1	1	0		21	1.4
AUG	1	0	1	4	0	1	0	2	2	0	3	0	1	1	0		16	1.1
SEP	2	4	3	2	5	4	0	0	3	1	1	2	0	1	0		28	1.9
OCT	2	5	2	2	0	0	2	2	0	0	2	0	0	1	1		19	1.3
NOV	2	2	2	2	3	0	1	1	2	3	1	0	0	0	1		20	1.3
DEC	4	1	0	4	1	1	2	1	1	0	0	0	1	0	1		17	1.1
totals	**20**	**27**	**18**	**19**	**19**	**11**	**15**	**15**	**15**	**12**	**16**	**8**	**6**	**6**	**11**		**218**	**14.5**

Switching Fatalities, SOFA-defined Severe Injuries, and Other Reportable Events

S*ource*: Switching Fatalities from *SOFA Database*; all other series from FRA, accessed June 01, 2012
***Note*: Among *SOFA Updates*, counts previously presented may change based on revisions to FRA data**

Year	SOFA Switching Fatalities	SOFA-defined Severe Injuries	Amputations (counts are included in SOFA-defined Severe Injuries)	All Reportable Employee Casualty to T&E Employees (includes Fatalities and Severe Injuries)	All Accidents	Human Factor Accidents	Highway-Rail Crossing Incidents	Trespasser Incidents (not at crossings)
1992	14	*	*	6,648	2,359	864	4,910	1,049
1993	15	*	*	5,649	2,611	865	4,892	1,032
1994	12	*	*	5,026	2,504	911	4,979	981
1995	11	*	*	4,215	2,459	944	4,633	955
1996	7	*	*	3,726	2,443	783	4,257	945
1997	11	139	20	3,489	2,397	855	3,865	**1,049
1998	8	137	27	3,642	2,575	971	3,508	**1,049
1999	9	135	18	3,835	2,768	1,031	3,489	924
2000	13	139	19	3,893	2,983	1,147	3,502	877
2001	8	140	19	3,561	3,023	1,035	3,237	915
2002	6	123	11	3,022	2,738	1,050	3,077	935
2003	10	114	15	2,935	3,019	1,230	2,977	896
2004	11	123	15	2,910	3,385	1,353	3,085	**878
2005	11	122	15	2,817	3,266	1,270	3,066	**878
2006	7	100	12	2,483	2,998	1,068	2,942	992
2007	6	110	16	2,520	2,692	1,046	2,778	877
2008	12	87	8	2,216	2,479	910	2,429	890
2009	8	53	6	1,967	1,907	654	1,932	760
2010	8	63	6	1,874	1,896	643	2,018	822
2011	4	69	11	1,707	1,979	720	1,966	769
2011, through March	1	22	4	453	507	179	507	138
2012, through March	**1**	**16**	**0**	**354**	**396**	**144**	**396**	**204**

***SOFA-defined Severe Injuries are defined only back to 1997** ****Counts happened to be identical for these successive years**

SOFA Education Section
20 Fatality Cases involving Shoving as the Direction of Movement

Education Section Purpose
SOFA places emphasis on education about **<u>why</u> switching Fatalities occur and <u>how</u> such Fatalities can be prevented**. This section presents selective Fatality cases – captured in short narratives – to emphasize particular events where employees lost their lives. Studying past cases can prevent future Fatalities.

Prepare for Case Review
Before reviewing the actual cases, gain some background. Read about shoving on *page 3* of this *Update*. Consult the SOFA Advisories and Lifesavers/Recommendations for mention of shoving. And, of course, review the applicable procedures on your railroad.

Fifty-seven (57) percent of the Fatalities that occurred from 1992 through 2009 involved shoving as the direction of movement. That is not to say that inappropriate shoving procedures were a cause, or even a contributing factor, of each Fatality. Clearly, that was not the case. There are many reasons why Fatalities occur. But shoving is very prevalent in switching operations. Inexperience employees may find shove movements particularly challenging. Performing shove moves safely has importance.

Case Review
- **Recreate Event:** After reading the short case narrative, recreate the switching environment before the task began. Describe how the environment may have changed as the switching task progressed. Describe how the final event occurred. Clearly, some narratives may not contain all the needed information. You may need to make some assumptions.

- **Relate Event to Your Experience:** Relate your recreation to situations you and your crew have encountered.

- **Develop Your Reasons and Remedie**s: Now, think of what may have caused the event. Develop a remedy that would have reduced risk.

Recognition and Respect
Intent is that case-based education will prove preventive. In reviewing, please be mindful that these employees lost their lives in railroad service, and that their families will forever bear the burden.

Information Sources
The switching Fatality narrative summaries were taken from the *SOFA Database*, which contains specifics about each case as developed by SWG in its review of on-duty fatality investigations (These investigations are required by *49 U.S.C. Section 20903*). The *2011 SOFA Report* contains information about Advisories, Lifesavers/Recommendations, and Special Switching Hazards. This and previous SOFA Reports are available at: http://www.fra.dot.gov/Pages/1781.shtml (click on 'Findings and Advisories' tab in upper left corner for the *2011 Report*; click on 'Findings and Recommendations' for earlier reports).

20 Fatality Cases involving Shoving as Direction of Movement

March 02, 1995 Aiken, SC Brakeman age 46
Switch crew was pulling a cut of cars out of an industry. Brakeman stepped in track gauge to open knuckle on the rear car at the same time crew shoved back to kick two cars that ran over the brakeman.

June 05, 1998 Hapeville, GA Yard Conductor/Foreman age 48
Three-person crew was performing industrial switching using a runaround track, the yard foreman was attempting to couple up two super-cushion boxcars in a curve with power attached in a shove movement. Drawbars bypassed and yard foreman was crushed between the ends of the two cars.

June 23, 1999 Redding, CA Conductor age 57
A three person switching crew was shoving a cut of cars down a track with the intent of coupling to another cut that was sitting in the track. It was hard to shove the cars and the conductor told the brakeman to look for closed angle cocks. The brakeman found a closed angle cock when the shove move was within two car lengths of a coupling, informed the conductor, and opened it. The conductor was crushed and killed between the leading car of the shove and the head car to be coupled to when the shove move unintentionally accelerated just prior to coupling.

September 14, 1999 Van Buren, AR Conductor age 47
A two person switching crew was in the process of shoving ten cars onto a clear track, with the intention of cutting three off, and pulling out the other seven cars out. The conductor counted down the cars via radio, and the engineer stopped one half-car lengths after the last radio transmission of one-half cars to go. Subsequently, the engineer discovered that the conductor had stepped in between the cars and had been coupled up.

August 12, 1993 Evandale, TX Freight Brakeman/Flagman age 52
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.

20 Fatality Cases involving Shoving as Direction of Movement (continued)

December 06, 1994 Campbell Hall, NY Brakeman Trainee age 28
The brakeman trainee was on the caboose to direct the shove move of the three engines, three cars and a caboose toward Track 1 in the yard. The shove move continued although the only radio transmission after getting the move started was "the derail is off." The movement, which reached approximately 19 mph, struck standing equipment after diverging through two mis-aligned switches and killed the brakeman trainee.

May 03, 1995 Evansville, IN Conductor age 52
Conductor was struck and killed by a shove move on the track adjacent to where he was working. Communication about the move on that adjacent track had been conveyed to the conductor via the "bleeder," a utility type employee.

February 02, 1997 Burns Harbor, IN Engine Foreman age 54
Two yard jobs working on adjacent tracks. The conductor of one is studying his switch list as the other job is shoving into the adjacent track. Conductor is struck and killed by the lead car of the adjacent track shove move.

June 01, 1998 Lubbock, TX Yard Conductor/Foreman age 24
Two yard engines working on adjacent tracks. One left a car fouling a clear track being used by the other engine. The foreman directing the shove move of the lite locomotives was crushed when his engine consist cornered the car fouling the adjacent track.

February 11, 2003 Flat Rock, MI Brakeman age 57
A three-person crew (engineer, conductor, brakeman) were stopped and the engineer and conductor were awaiting the brakeman's return from the "Trim Shanty". During this time, another crew was in the process of shoving a cut of cars down a track that was located between where the brakeman's crew was waiting and the Shanty. The brakeman exited the Shanty and was struck by the shove move as he crossed the tracks to get to his crew. The shove move was being preceded by two of the striking train's crew who were riding in a van at the time.

20 Fatality Cases involving Shoving as Direction of Movement (continued)

October 04, 2004 Harrisburg, PA Conductor age 58
A switch job was shoving cars into a yard track while another switch job was shoving cars on an adjacent track. The two tracks were separated by an 18 foot access road. The conductors discussed their movements with each other prior to the incident. The conductor of one switch job improperly positioned himself next to the adjacent track, and was struck by the other shoving movement.

November 13, 1993 Macon, GA Yard Conductor/Foreman age 47
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.

January 12, 1999 Port Newark, NJ Conductor age 54
A three person industry switching crew was in the process of switching cars back and forth over a private crossing equipped with an in-ground hand throw switch. The brakeman was at the switch and the conductor was going back and forth from one set of cars to another. The conductor shouted to the brakeman that he wanted the next move down one track but the cars started down the other. The brakeman tried to warn the conductor who had his back to the move and then stopped the move but too late to save the conductor who was hit and run over by the leading car of the shove.

April 11, 2003 Pocatello, ID Conductor age 55
A road conductor was riding the point of a 122-car shove down a track that was partially out of service. The out of service portion was marked by a red flag and derail. The crew was not able to stop the movement before the car being ridden by the conductor went over the derail, landed on its side and crushed the conductor to death.

April 11, 2005 Ogden, UT Switchman age 38
A remote control assignment was switching on the east end of the yard. While making a shove movement into a yard track with a helper riding on the leading end of a tank car, the movement struck 28 standing cars in the track causing the helper to fall from the tank car, which then ran over helper.

20 Fatality Cases involving Shoving as Direction of Movement (continued)

November 16, 2005 Lugoff, SC Conductor age 48
A three person crew shoving into an industry track found cars left foul of an adjacent track by industry employees. The conductor held a job briefing with the brakeman on the moves to be made, and the brakeman understood he would control the switching and car movements. After shoving the cars to make the coupling, the conductor told the brakeman the cars were coupled and he was in the clear. The brakeman attempted to uncouple from the cars, but failed. He then requested the engineer make a second move to create slack between the cars so they could be uncoupled. The engineer complied and the conductor who was in the foul of track and equipment suffered fatal injuries.

August 30, 2007 Stockton, CA Yard Brakeman age 50
A remote control operator controlling a shoving movement was riding the leading end of the two car move when he struck the side of another standing car. The standing car fouled the crossover switch which the movement was lined to operate through, killing the operator.

January 28, 1992 Willmar, MN Yard Brakeman/Helper age 57
A four-person crew (engineer, switch foreman, 2 switchmen) had just shoved cars into track 11 and held onto one for track 9. The switch foreman got the switch for 9, noticed his front switchman standing near cars on track 11, and rode the locomotive onto the lead. After the 11th switch was lined for the lead, the switch foreman kicked the single car into track 9. The front switchman was struck and killed by the free rolling car.

July 15, 1993 Anderson, IN Yard Brakeman/Helper age 43
After the brakeman had tied the locomotives onto a cut of cars in the yard, the engineer received an instruction, via radio, from the brakeman to "shove to hold more cars." The engineer began to shove and didn't stop until he was on the other end of the track. The brakeman was run over by the shove move. There was no evidence of any other radio transmissions concerning the shove move.

August 11, 1993 Tracy, CA Freight Brakeman/Flagman age 47
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.