

TransACTIONS



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Employee Selection & Training: The Keys to a “Best in Class” Fleet Safety Program

By Jack Fearing, CPEA

Motor vehicle accidents are the leading cause of employee deaths and injuries in the workplace and have been for the past several years. Not long ago, motor vehicle fatalities were not even one of the top five causes of fatalities in the workplace.

Traditional workplace activities such as slips and falls, fires and explosions and contact with objects and equipment were always among the leaders in this area. Workplace violence began to appear on the list in the past decade as a new factor. However, all of these tragic events have

been supplanted by transportation-related incidents, which accounted for 43% of all fatal occupational injuries in 2005 (Bureau of Labor Statistics (BLS)). Figure 1 represents more than the next three categories combined.

Motor vehicle accidents, both on and off the job, have far-reaching financial and psychological effects on employers, employees, coworkers and affected family members. Developing and maintaining a comprehensive fleet safety program should be a vital part of your company’s safety culture. The program must work to keep employees and those with whom they share the road safe.

The program must include efforts to change driver attitudes, improve behavior and increase skills to build a safe culture within the organization. Instructing employees in safe driving practices will help a company avoid unnecessary tragedy. The goals of a fleet safety program are simple:

- Save lives and to reduce the risk of life-altering injuries within the workplace.
- Protect the organization’s human and financial resources.
- Guard against potential company and personal liabilities associated with crash-

es involving employees driving company-owned or leased vehicles on company business.

“Best in Class” Fleet Safety Program Components

The Network of Employers for Traffic Safety (NETS) has developed a 10-step program for various size commercial sales organizations and light vans and trucks under 26,000 lb GWT. Implementing and following these steps will help protect a company’s employees and assets as well as control its vehicle insurance costs.

- 1) senior management commitment and employee involvement;
- 2) written fleet safety policies and procedures;
- 3) driver selection and agreements;
- 4) motor vehicle record (MVR) checks;
- 5) timely accident reporting and investigation;
- 6) vehicle selection, maintenance and inspections;
- 7) disciplinary action process;
- 8) safe driver rewards and incentives;
- 9) driver safety training and communications;

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Doug Cook

Administrator's Message

We have seen several new challenges within the Transportation Practice Specialty (TPS) since the last issue of *TransActions*. For the first time in my line of work, we see proposed regulations governing the application of electronic onboard recording devices used to keep track of truck drivers' hours. Increased involvement in highway transportation security programs, such as Highway Watch, proves that our industry is changing.

Last month, Mike Semones of Brinks Inc., hosted the TPS Advisory Committee meeting in Tampa, FL. We appreciate Mike's hospitality, Brinks' generosity and the warmth of Tampa.

This year's Safety 2007 professional development conference will provide us opportunities for educational and professional advancement. Three TPS members will present concurrent sessions and a roundtable discussion. Plan to attend

these informative and useful presentations. I also invite all TPS members to attend our Advisory Committee meeting, which will be held on Monday, June 25, at 5:30 p.m.

On Sept. 12-13, 2007, TPS will sponsor a Transportation Symposium, "Improving the Effectiveness of Fleet Safety Programs." UPS will host this symposium at its corporate headquarters in Atlanta, GA. Please mark your calendars to attend (see p. 15).

This is Nancy Bendickson's last issue as editor of *TransActions*. She has served TPS diligently in her term as our award-winning editor and we thank her for her hard work. Please also join me in welcoming Nadine Levick as our new editor. See you at Safety 2007 in Orlando.

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Fire & Explosion Investigations: Why Heavy Trucks May Burn

By Chris Ferrone & Charles Sinkovits

A basic misconception exists that diesel fuel does not explode and/or ignite upon a collision or impact. This particular chain of events does, in fact, occur. However, it is not always thoroughly investigated or understood.

The purpose of this article, through mechanical analysis and accident reconstruction, is to inform truck manufacturers and operators of this hazard. In addition, it discusses design alternatives that will aid in mitigating and/or preventing injuries altogether.

A Fiery Explosion

On Jan. 9, 2001, on U.S. 49 in the State of Louisiana, a tractor-trailer was maneuvering into a driveway to make a delivery. During the process, the tractor was struck by another truck, which was attempting to pass (Figure 1). The impact was to the driver's side area of the first tractor—specifically to the location where the fuel tank and battery box reside (Photo 1). A witness reported that the first tractor burst into flames upon impact. The driver was trapped and died as a result of the fire.

Over the past 2 years, we have investigated four similar accidents. In each case, a truck tractor was involved in a collision that resulted in an explosion and/or fire. In each incident, the fact pattern was similar—the battery box and fuel tank area were impacted simultaneously or in close sequence. A full-scale fire arose and destroyed the equipment (Photo 2) (Appendix A).

In the event of this type of collision, most cars' front bumper will contact the fuel tank of a truck tractor on or about the tank's longitudinal centerline (Photo 3). The same goes for pickup trucks, SUVs and other trucks/tractors front bumpers. This event may then lead to a fuel spill.

Additionally, the placement of the battery box in such close proximity to the fuel tank can become an ignition source for the potentially spilled and/or atomized (spray) diesel fuel.

- Automotive bumpers range in height from approximately 13 in. to 23 in. from the ground.

- Tractor fuel tank centerline is approximately 24 in. from ground.

- Tractor battery tray/bracket distance to fuel tank is approximately 2 in.

- Tractor battery tray is approximately 25 in from ground.

A study of various truck tractor battery box and fuel tank locations was conducted. As noted, the contention is that in most cases, the battery box resides within inches of the fuel tank, an arrangement not unique to any one manufacturer. In some cases, the battery box can be as close as 2.5 in. from the fuel tank (Photo 4).

Therefore, the two hypotheses are as follows:

- 1) Truck tractor battery box and fuel tank are too close.
- 2) The location of the truck tractor battery box and fuel tank are exposed and coincident with automotive bumper heights.

Basis for Hypotheses

Various measurements and photographs were taken of automobiles and truck tractors interacting alongside another truck tractor (Photo 5). These measurements and photographs clearly show that if a collision was to occur with a truck tractor on the lefthand side near the batteries and fuel tank area, then a fuel spill and ignition source (battery) would be present.



Photo 1 (above): Location of fuel tank and battery box on the first tractor.



Photo 2 (right): Vehicle destroyed by fire.



Photo 3 (left): Front bumper contact.

Photo 4 (below): Battery box location.

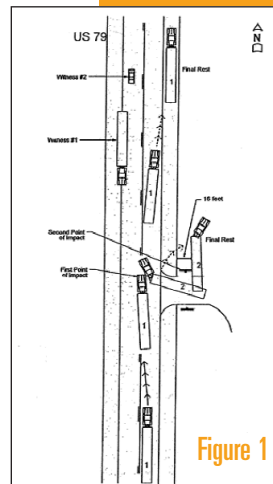
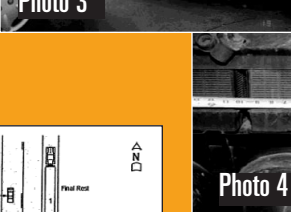


Figure 1

If a Hazard Exists, Use Safety Hierarchy

Since we know a hazard exists, the safety hierarchy must be employed so that an alternate system design can be made available to replace the current design. The hierarchy asks the designer to:

- design out hazard;
- guard against hazard;
- warn of hazard;
- instruct/train;
- use PPE.

In this instance, designing out the fuel tanks (relocating them) would be cumbersome and impractical. The next logical step is to limit the ignition source by relocating the battery box. The most practical and beneficial approach to this is to relocate the battery box to inside the frame rails in the already clear/free space just behind the cab (Figure 2a and 2b).

The reader must realize that relocating the battery box to within the frame rails as suggested is not novel to the authors. Freightliner Corp. currently employs this design scheme on its Century, Coronado

Appendix A

Make: Volvo
Model: VNL64T
Class: 8
Year: 1998
VIN: 4VG7DBRFOWN761068
Wheel base: 164 in.

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Employee Selection & Training

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10) regulatory compliance.

This article focuses on driver selection and training, and provides a glimpse of the costs of accidents and emerging fleet safety regulations.

Driver Selection & Agreements

A thorough examination of driving records of all potential new hires and employees who drive company vehicles is an important component of a fleet safety program. Establishing and managing this process is often contracted out to a third-party provider. A company must screen out drivers who have poor driving records since they are most likely to cause problems and have accidents in the future. An MVR should be obtained and reviewed before hire and periodically thereafter to ensure that a company's drivers maintain an acceptable driving record. The fleet safety program must clearly define the number of violations an employee can have and the related point values for each before losing the privilege of driving a company vehicle. Loss of this privilege can also result in termination for an inability to perform an employee's job function, which is particularly true in sales organizations.

Employers should also establish a contract with all employees who drive company-owned or leased vehicles. By signing an agreement, employees acknowledge their awareness and understanding of the company's fleet safety program, including its requirements and expectations regarding driver performance, following vehicle maintenance and timely reporting of accidents and moving violations.

A sample criteria is provided in Table 1 that can be used to screen both new hires and employees. The proper amount of care and planning used in selecting and retaining employee drivers will have a definite affect on a company's bottom line regarding preventable accidents and unnecessary losses. It is very important to take the time to identify and remove unsuitable drivers from the fleet.

Driver Safety Training & Communications

Providing continuous and comprehensive

FIGURE 1 BLS Statistics (2005)

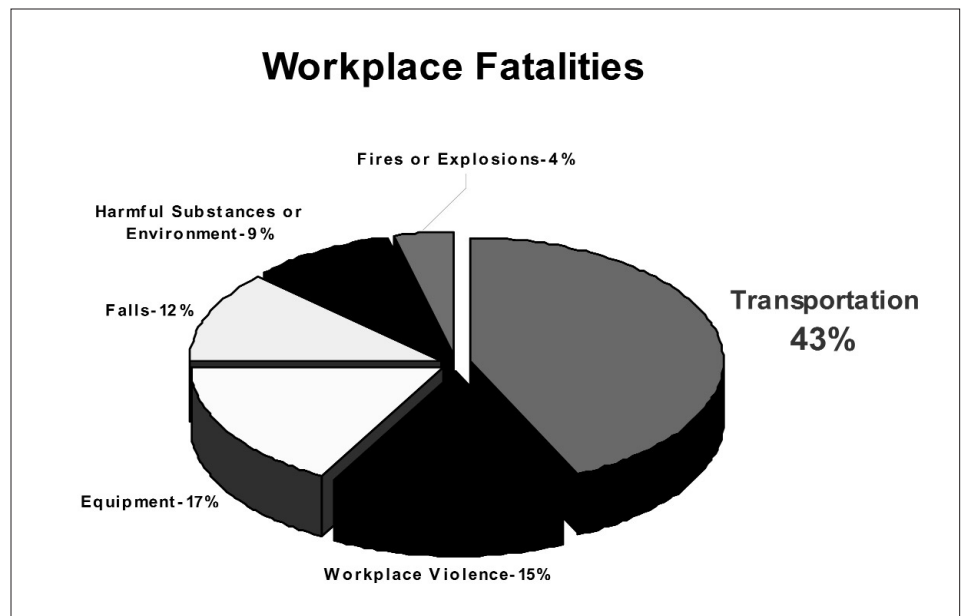


TABLE 1 New Hire Driving Record Acceptability Criteria

Unacceptable Driving History
Currently suspended license due to moving violations.
2 or more moving violations in the past 24 months.
2 or more preventable accidents in the past 24 months.
Gross or willful negligence* within the past 24 months.
<small>*Includes, but not limited to, DUI/DWI, felony while driving, falsifying driving records, leaving the scene of an accident and allowing unauthorized persons to operate company vehicles.</small>

driver safety training and communications are vital to a successful fleet safety program. Even experienced drivers benefit from periodic training and reminders of safe driving practices and skills. Statistics show that drivers under the age of 25, especially males, including those who drive company vehicles and untrained employee drivers of any age are the two most likely groups to have a preventable motor vehicle accident. Untrained drivers typically are responsible for over 60% of all fleet accidents.

Furthermore, employees are most susceptible to having an accident during the first 5 years of their employment (Figure 2). These facts underscore the critical need to provide training to employees as soon as possible, especially to younger, entry-level drivers.

The training challenges facing most fleet businesses are three-fold: 1) verifying the driving history and safety record

of newly hired drivers; 2) providing quality training and proper documentation at the time they are hired; and 3) providing yearly refresher training/communications.

Several components to driver safety training must be considered when developing a company's specific program. These include initial training for new hires, refresher training for all drivers, risk-level change training, training for authorized nonemployee drivers and manager training for employee observation rides.

Initial Training

New employee drivers should receive formal safety training as soon as possible, preferably before being issued a vehicle. This training should include program requirements, the company fleet service program and behind-the-wheel instruction. In extenuating circumstances where this timing is not possible, the new hire's

manager should provide some form of documentation.

Annual Refresher Training

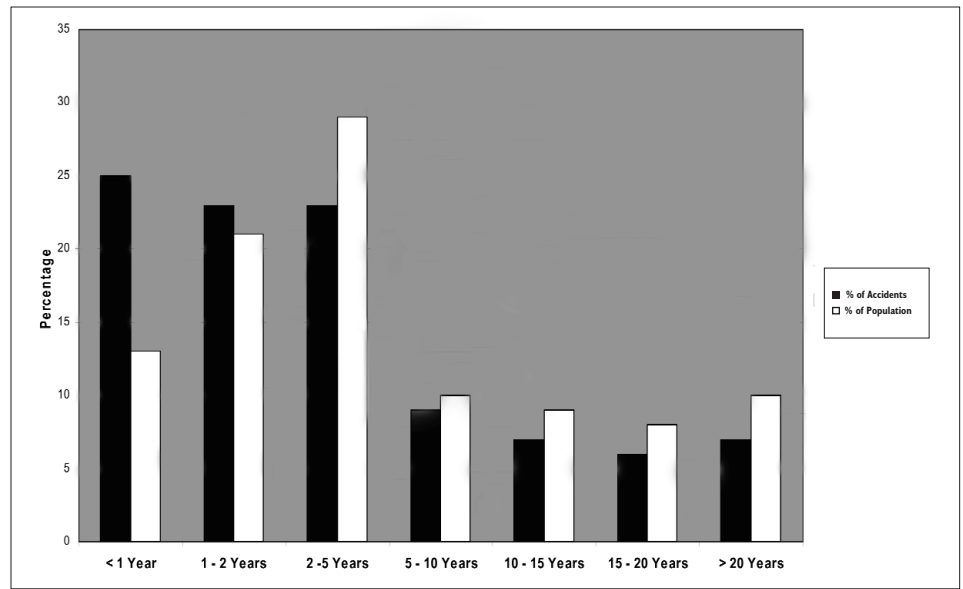
Refresher safety training should be provided to each employee driver at least annually. Ideally, it should be either behind-the-wheel training or another type that allows the driver to experience the same types of situations s/he will encounter during the course of both normal and emergency driving situations.

Several types of nontraditional, hands-on training programs are available. These include web-based, desktop and simulation. Of these, the recent emergence of commercial driver safety simulation training offers the most realistic options and scenarios.

The leading company in this industry is Virtual Driver Interactive (www.driverinteractive.com). Its product includes the latest in technology and graphics, an unbiased instructor and a low-stress environment. It only reinforces “good” driving habits and does not criticize “bad” driving habits. The technology features immersive graphics, realism and relativistic clues for accelerated learning. Myriad driving scenarios offer various weather conditions and road conditions, a mixture of rural and urban environments, and many unexpected hazards and emergency situations.

The virtual trainer also uses actual car parts and components to lend another dimension of practicality and the program’s assessment system offers accurate and documented training records. Course

FIGURE 2 U.S.-Based Multinational Pharmaceutical Company (2004)



completion includes a certification of completion of the National Safety Council’s DDC 6/8 Defensive Driving Course. Figure 3 provides a comparison of behind-the-wheel and/or simulation training and traditional classroom training.

Risk-Level Changes

Drivers whose driving record has resulted in a risk-level (RL) change from RL-1 to either RL-2 or 3 (Table 2) should receive additional training as soon as possible. This supplemental training should be at the driver’s expense and not used as a substitute for regularly scheduled training. Either traditional behind-the-wheel or simulation training is ideal for this type of requirement. Generally, this also should include a

documented manager’s observation ridealong before returning to normal job duties.

Nonemployee Drivers

All nonemployees who are authorized to operate a company vehicle should complete a supplemental driver education program and should provide the company with a certificate of completion before being allowed to operate a company vehicle.

Manager’s Observation Ride

All managers should conduct an annual, documented road observation ridealong of all drivers under their supervision to ensure that the drivers comply with company procedures. This should include an observation of vehicle inspection, vehicle operation and the driver’s safety attitude.

Other circumstances may require a more frequent observation ridealong, including a risk-level change, involvement in a preventable accident and a return to driving duty after an extended absence because of situations such as personal injury or illness, or maternity leave. Managers must be trained on how to plan and conduct the ride so they have the necessary tools and insights regarding the objective of this program.

Communications

Ongoing safe driving communications are an important part of the overall fleet safety program. Driver safety materials can include DVDs, videos, audiocassettes, web-based information via the company intranet, e-mails, and specially produced booklets and newsletters. Specific infor-

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TABLE 2 Existing Employee Driving Record Acceptability Criteria

Risk Level 1	Risk Level 2	Risk Level 3
<p>Current Valid License.</p> <p>Less than 4 points* in the last 12 months.</p> <p>Less than 6 points in the last 24 months.</p> <p>Less than 10 points in the last 36 months.</p>	<p>Between 4 and 6 points in last 12-month period.</p> <p>Between 6 and 9 points in last 24-month period.</p> <p>Between 10 and 12 points in last 36-month period.</p>	<p>7 or more points in last 12-month period.</p> <p>10 or more points in last 24-month period.</p> <p>13 or more points in last 36-month period.</p> <p>Gross or willful negligence.</p> <p>Suspended license for moving violation and/or DUI/DWI**.</p>
<p>*Point values may differ from state to state. An internal system should be established to include a standardized interpretation.</p> <p>**Driving Under the Influence/Driving While Intoxicated.</p>		

Employee Selection & Training

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mation might include the company policy on seatbelt use, cell phones and other types of distractions while driving. All drivers should be required to familiarize themselves with the company fleet safety communication materials.

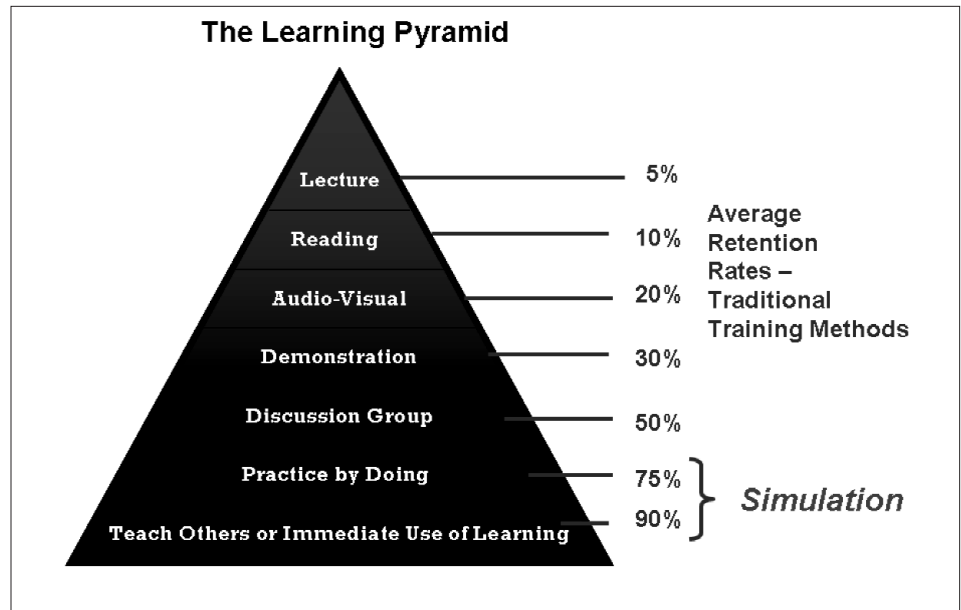
Many keys to success exist for driver safety training and communications. These include employee buy-in, conducting the training at the right time and place, providing hands-on options in a nonthreatening environment and including all critical teaching points specific to the company. These can typically be best identified through a detailed loss analysis with the company's insurance provider or carrier.

Ultimately, some form of documented training is always better than none. Using a blended training approach and curriculum along with frequency of training are key in achieving skill transfer and mastery of the training topic.

However, training budgets are typically limited, which creates a strain on organizations to implement training programs that reach wider and deeper than simple "awareness" programs. Because web-based training is interactive and cost-effective, it has become the top option for many organizations. The same advantages are available with simulation training. In both—unlike traditional classroom training—employees can train at their own pace and have the flexibility to train when it is convenient for them.

Tracking driver performance records and completed training documentation can protect an employer's liability down the road. An employer also must show that proper training is a priority and when issues arise, the employer must address them appropriately. Concentrating on the

FIGURE 3 Comparison of Behind-the-Wheel and/or Simulation Training



most costly accidents (and the habits that cause them) is crucial. Opportunities for continuing education, driver orientation and annual performance reviews are critical components. Unfortunately, even the largest fleets often neglect injury prevention and continuing education.

Financial Impact on the Company's Bottom Line

Motor vehicle crashes reportedly cost employers more than \$60 billion annually in medical care, legal expenses, property damage and lost productivity. They also have an adverse impact on the cost of benefits such as workers' compensation, social security benefits, and private health and disability insurance. In addition, they can increase a company's overhead involved in administering these programs.

According to a U.S.-based multinational pharmaceutical company, the average motor vehicle accident cost an average of \$16,000 in 2004.

When an employee had a work-related motor vehicle accident that resulted in an injury, the cost to the company increased to an average of \$74,000. Costs can easily exceed \$1 million when a fatality is

involved. Off-the-job motor vehicle accidents are costly and disruptive to employers as well.

Looking Ahead

On Feb. 15, 2006, ANSI approved ANSI/ASSE Z15.1, Safe Practices for Motor Vehicle Operations. This national voluntary consensus standard contains seven primary elements and several appendices.

Elements include scope, terminology, leadership responsibilities, operational issues, driver management, vehicle selection and recordkeeping. The appendices include a sample procedure and various sample accident policies.

While this is a breakthrough in fleet safety management, the standard is not an enforceable law and no penalties exist for noncompliance. However, responsible companies should embrace this standard and use it as a model to enhance their fleet safety program and to protect their employees and assets.

Other regulatory-related activities to be aware of and include in a fleet safety program are the mandatory use of seatbelts in most states and various state laws on the use of cell phones. An effective fleet safety program should include all of the various state and local regulations in the geographic areas in which a company operates.

Conclusion

Work-related motor vehicle accidents are largely preventable. No company can

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Distractions & Driving

In 2003, AAA unveiled a new study on distracted driving. The study, which used in-car video to record the actions of volunteer drivers, found that wireless phones were the eighth most common distracted driving activity, out of nine. The study found that distraction of all types is an everyday occurrence. The results were as follows:

- Reaching or leaning: 97%
- Adjusting radio: 91%
- Conversing: 77%

- Eating, drinking: 71%
- Grooming: 45%
- Distracted by passenger: 44%
- Reading or writing: 40%
- Using a cell phone*: 30%
- Smoking - 7%

*Using cell phones while driving without a hands-free device is illegal in some municipalities and states (such as New Jersey and New York).

Fire & Explosion Investigations

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and Columbia tractors. Photo 6 and dimensional drawing (Figure 3) of a typical Century tractor are included showing the design scheme today. This design dates back to 1996 when it was introduced on the Century tractor.

What Is Required for a Fire?

Three elements are needed to create a fire: air, fuel and an ignition source. Air is everywhere, so there is an abundant supply of the first element. Fuel, the second element, is the diesel fuel in a truck's fuel tank, which in this scenario, is located right next to the third element, the ignition source—in this case, the battery box.

Along with air, fuel and an ignition source, atomization of the fuel must occur in order to satisfy the stoichiometric requirement (14:1) to burn. The atomization increases the surface area of the fuel by creating small spheres or droplets. This increase in surface area is what allows the air to properly mix with the fuel for the stoichiometric ratio to be satisfied. Once

this ratio has been met, a fire can occur. The atomization comes from the impact of the fuel tank as a result of the volumetric shape change and breaching that the tank goes through during the collision.

Additional ignition sources are abundant but should be carefully analyzed before selection. In these accidents, the battery boxes were impacted directly or in coincidence with the fuel tank. Upon impact, the batteries themselves or a cable (system element) can be damaged, creating the ignition source. Since the batteries can create a large sustained spark it can, in some cases, be the ignition source of the fire.

Signatures

An explosion and fire of this type leaves many mechanical and fire-related signatures including impact to the battery box and fuel tank area (Photo 7); battery tray and support structures are damaged (Photo 8); fuel tank supports are damaged or reoriented (Photo 9); the companion fuel tank (passenger side) of the truck tractor is usually uninvolved from an explosion/fire point of view; an uninvolved fuel tank usually shows a volumetric "fuel level line," which indicates how much fuel was in the tank at the time of the fire (Photo 10); in some cases, evidence showed the battery box being pushed into the fuel tank toward the rear of the tractor (Photo 11).

Other Ignition Sources

In all of these investigations, alternate sources of ignition were evaluated. In each, the bullet vehicle was inspected and concluded not to be an independent ignition source of these fires. Specifically, the striking vehicle was inspected to see whether any signatures were present that would make it the ignition source. In each of the four investigations, the striking vehicle was ruled out as the ignition source. These alternate ignition sources may be autoignition contact and electrical in nature.

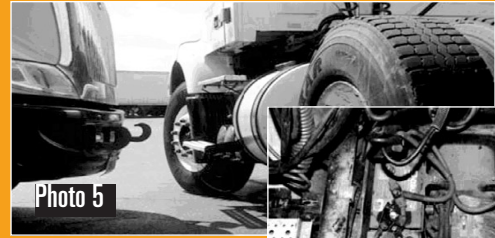


Photo 5 (above): Automobile and truck tractor interaction.

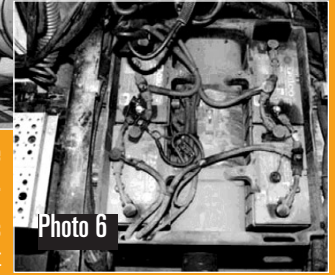


Photo 6 (right): Batteries inside frame rails (Freightliner Century Class).



Photo 7 (left): Impact to the battery box and fuel tank area.



Photo 8 (below): Battery tray and support structures are damaged.

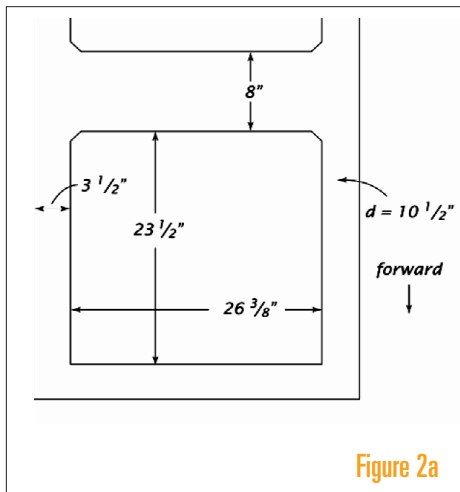


Figure 2a

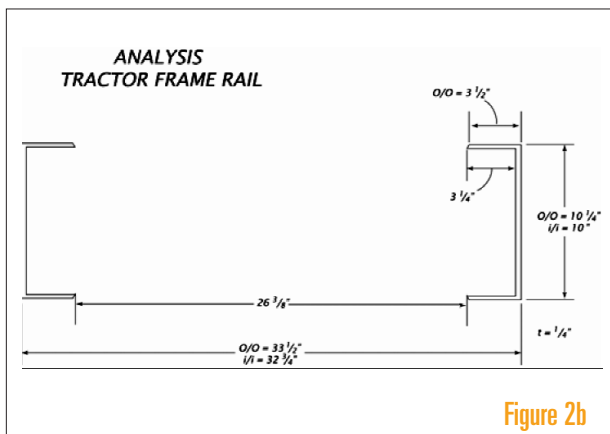


Figure 2b

Solution

Freightliner Corp. has employed a design scheme, which since 1996, precludes this hazard in most cases.

On many of its tractors, Freightliner installs the batteries inside the frame rails. The battery cables are nested inside the frame rails along with the batteries. This design, assuming this area is not intruded upon, provides protection from impact in most cases. The fact that the battery is no longer adjacent to the fuel supply significantly reduces the fire hazard. In other words, it takes the potential ignition source away from the fuel source, thus reducing the risk of the fire/explosion hazard. This design scheme has been installed on tractors with a wheelbase as short as 162 in. (Appendix B) as well as on long-wheelbase sleeper tractors. As a result, packaging typically is not a design constraint.

Proof Test Alternative Design

Relocating the batteries and/or battery box must be examined for acceptability. Is it technically feasible and economical? Does it have engineering acceptance? Is it accepted by the user base?

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Fire & Explosion Investigations

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Technically Feasible

Since the alternative only proposes moving the battery box to inside the frame rails in a nested orientation, no technical hurdles would be present. Moving the batteries simply consists of fabricating steel brackets and forming a plastic/composite box to fit around the drive shaft. The author has inspected other brands of Class 8 truck tractors with batteries inside the frame rails (Photo 12) (Appendix C).

Sterling1, a division of Freightliner, has a model with batteries located within the frame rails. This may not appear impressive, but this tractor appears to be generally the same as Ford Heavy Truck's original design but with Freightliner battery location/design. This design can be employed into other truck tractors with minimal design efforts.

The authors also investigated voltage/ampere drop associated with longer cables and concludes that typical truck tractors use four batteries totaling 2,500 CCA (625 x 4). This energy is passed through cables that are 5/8 in. in diameter.

The Freightliner Century Class tractor with batteries in the frame rails uses four batteries totaling 2,800 CCA (700 x 4). This energy is passed through the same diameter cables as other tractors of 5/8 in. The difference in size from a 625 A battery to a 700 A battery is not consequential.

Economics

An examination of proposed part costs was conducted. However, this analysis was done with retail pricing. Therefore, an exact cost offset is not possible because the markup of the analysis tractor or Freightliner parts is unknown. A comparison analysis of parts

required for the present system to the proposed Freightliner system concludes that the Freightliner system is approximately \$229 more than the system parts requirement at present day.

However, \$229 is present-day value. The analysis truck was produced in 1998. Therefore, the actual cost differential is less than \$229 in 1998 dollars. The analysis truck purchased new was valued at \$58,000. Considering that \$229 is less than 1% of the value of the truck, economics should not be a concern.

Engineering Acceptance

The concerns are whether or not the alternative design poses a hazard, creates any type of operational interference or resolves the issue at hand.

Hazard

Moving the battery box to within the frame rails does not create new hazards. This task is simply comprised of rerouting the battery cables along with providing a compartment for the batteries to reside.

Individuals adverse to this position will suggest that a frontal collision will drive the power train rearward into the batteries if relocated here. If this were to happen, all that would likely occur is a battery/



Photo 9



Photo 10



Photo 11

Photo 9: Fuel tank supports are damaged or reoriented.

Photo 10: An uninvolved fuel tank usually show a volumetric fuel level line, which indicates how much fuel was in the tank at the time of the fire.

Photo 11: Battery box moved rearward.

Photo 12: Sterling truck/tractor.



Photo 12

Appendix B

Make: Freightliner
Model: Columbia
Class: 8
Year: 2005
VIN: 1FUJFOCV35LN77629
Wheel base: 162 in.

Appendix C

Make: Sterling
Model: AT 9513
Class: 8
Year: 08/02
VIN: ZFWJA3AS53AK82003

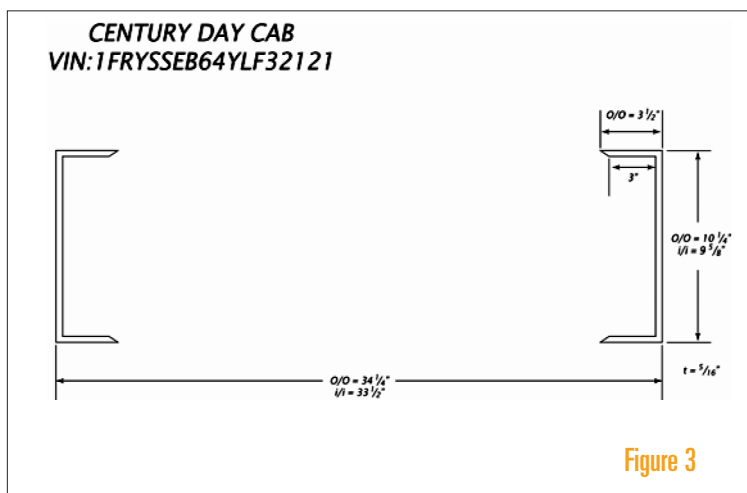


Figure 3

investigating heavy-truck accidents, the authors have witnessed various “heavy” collisions. However, the power train is typically thrown from its mounts and/or the engine breaks away from the transmission at the bell-housing. A power train rearward migration of this magnitude is far less likely than the more frequent side impact with the unprotected battery/fuel tank combination. Considering the fact that Freightliner has employed this design since 1996, it is reasonable to suggest that Freightliner engineers have considered the “hazard” of the power train migrating rearward in the direction of the nested batteries and dismissed it as a non-issue.

Operational Interference

Moving the battery box to inside the

In 17 years of

frame rails will not create any operational problems or maintenance interference. Drivers typically do not interact with the batteries frequently. If the truck must be jumpstarted, remote jump-posts (already in use) can be contemplated for installation in a safe location (Photo 13).

As for maintenance, the current location on a typical truck tractor requires the mechanic to remove the fiberglass fering to access the batteries. The Freightliner design has immediate access by removing an expanded metal “catwalk” (Photo 14). In the unlikely event that the Freightliner design was too difficult for a mechanic, one would think that:

1) the design would have changed since 1996 but has not.;

2) Freightliner would have discontinued it since its inception, but the company has not.

Therefore, all claims for operational interference are not an issue.

Actually Works

Moving the batteries to inside the frame rails will not cause any problems with the electrical system and will allow the vehicle to function as expected. This comes with the one minor exception of using four 700 CCA batteries instead of 625 CCA batteries.

Solves Issue at Hand

Moving the batteries to inside the frame rails would have, in many instances, eliminated the ignition source of the fire. Physical evidence shows that the batteries were in fact contacted during these collisions in at least the four investigations the authors conducted. Furthermore, no physical evidence suggests that the proposed location was intruded upon.

Further methodology analysis shows that this design is tested, both in the field since 1996 and most likely before that at the Freightliner proving grounds. In addition, the fact that this concept/design has been subjected to peers and has been in existence since 1996 without major design changes or recalls, positions it as a viable solution to the issue at hand. Furthermore, thorough investigations have been conducted for recalls on this design and to date, none have been found.

System Concerns

Others in the industry have resisted this design scheme by proposing utility downsides, maintenance concerns and packaging problems. Some utility downsides are excessive voltage drop, poor start ability and additional wiring. We have investigated and tested these ideas and have concluded that none of these concerns are valid from an engineering or operational perspective.

With respect to voltage drop of a truck tractor with in-rail batteries and a truck tractor with batteries located in the classic location, the classic location had a voltage drop of .54V and the in-rail truck had .74V. The difference of .20V is negligible and will not create any unwanted results (Appendix D presents test data). As far as the ability to jumpstart a dead battery, remote jump posts are employed to facilitate this concern.

Other Advantages

The inner frame-rail mounted battery configuration has other advantages as well. Weight/balance of the tractor is enhanced since the batteries are now symmetrically located about the longitudinal centerline of the frame rails. Cantilever battery box support failures are eliminated since the brackets holding the batteries in the Freightliner design are loaded symmetrically. With batteries located between the frame rails, one can expect prolonged battery life, easier access for replacement, no box corrosion (due to composite box),

Appendix D

Voltage/Amperage Testing Data

Testing was conducted to show that that voltage drop is not a concern with in-frame batteries.

Volvo tractor (exemplar)
 Penske unit: # 5509726
 VIN: 4V4MD2AF2YN241481
 Voltage drop: .74 volts (during cranking)
 (battery to starter solenoid)
 Amperage draw: 1426 max, 900 steady state (during cranking)
 Alternator output: 38A idle/26A stabilized
 26A max rpm
 44A idle/max rpm (full electrical load)
 Cable length: 50 in. approx. d = 5/8 in.
 Freightliner Columbia
 Penske unit: #274271
 VIN: 1FUJA6CG81PJ9597
 Year: 01/01
 Voltage drop: .74 volts (during cranking)
 (battery to starter solenoid)
 Amperage draw: 1200 max, 800 steady state (during cranking)
 Wheel base: 170 in.
 Cable length: 90 in., d = 7/8 in.

weight reduction and reduced shorting due to cable arcing (see www.freightlinetrucks.com/trucks/find-by-model/featuresbenefits.asp?id=2; and www.selecttrucks.com/insideselecttrucks/magazine/archive/tried-true.asp).

Alternatives

As a further alternative, based on the truck tractor configuration and application, a fuel tank and battery box location matrix is suggested if locating the batteries inside the frame rails is not possible.

- If short fuel tanks (dual), move battery box away from fuel tank creating a larger gap (same side).

- If only one fuel tank, locate battery box to opposite side of tractor.

- If dual tanks are required, make one large (long range) and one smaller while mounting the battery box on the side with the short tank, creating a greater gap.

- If the truck tractor is COE-configured, the batteries may be located symmetrically on top of the frame rails (Photo 15). Tests were conducted to compare the voltage drop of a truck tractor with in-rail batteries and a truck tractor with batteries located in the classic location. The classic location had a voltage drop of .54V and the in-rail

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Photo 13: Engine compartment jump post.

Photo 14: Battery access covers, (Freightliner Century).

Photo 15: Navistar COE.



Photo 14



Photo 15

Federal Highway Administration Issues Final Rule to 23 CFR Parts 657 & 658

Editor's Note: On Feb. 20, 2007, Federal Highway Administration (FHWA) offered a final rule to 23 CFR Parts 630 and 658. The rulemaking is part of FHWA Docket No. FHWA-2006-24134RIN 2125-AF17.

Size & Weight Enforcement & Regulations

The FHWA final rule amends the regulations governing the enforcement of commercial vehicle size and weight to incorporate provisions enacted in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), the Energy Policy Act of 2005 and the Transportation, Treasury, Housing and Urban Development, the Judiciary, the District of Columbia and Independent Agencies Appropriations Act of 2006. This final rule adds various definitions, corrects obsolete references, definitions and footnotes, eliminates redundant provisions, amends numerical route changes to the National Highway designations and incorporates statutorily mandated weight and length limit provisions. This final rule was effective March 22, 2007.

Background

The SAFETEA-LU, the Energy Policy Act of 2005 and the Transportation, Treasury, Housing and Urban Development, the Judiciary, the District of Columbia and Independent Agencies Appropriations Act of 2006 enacted size and weight provisions concerning auxiliary power units, custom harvesters, over-the-road buses and drive-away saddle-mount vehicle combinations.

Additionally, the transfer of motor carrier safety functions to the Federal Motor Carrier Safety Administration (FMCSA) established by the Motor Carrier Safety Improvement Act of 1999 (MCSIA) (Pub. L. 106-159, 113 Stat. 1748) affected the internal organizational structure of FHWA.

Although the responsibility for commercial motor vehicle size and weight limitation remained in FHWA, the references in the regulations to the old FHWA's Office of Motor Carriers (OMC) and its officials are obsolete. This action updates these references to reflect the changes in the agency's organizational structure.

Comments on Notice of Proposed Rulemaking

On May 1, 2006, FHWA published an NPRM in the *Federal Register* to provide an opportunity for public comment on the proposed changes to 23 CFR Parts 657 and 658. In response to the NPRM, FHWA received 39 comments. Comments included those from 8 state enforcement agencies, 9 industry associations, 4 members of Congress, 14 individuals, a union (multiple members), a law firm representing a trucking company, 1 intercity bus company and an association of state transportation officials. FHWA considered each comment in adopting this final rule. The changes made in response to those comments are identified and addressed under the appropriate sections below.

Section-by-Section Discussion of the Proposals

Part 657 Section 657.1 Purpose

Michigan DOT (MDOT) expressed concerns about using the terms "Federal-aid Interstate, Federal-aid primary, Federal-aid Secondary or Federal-aid Urban Systems," which are no longer used, to describe the size and weight enforcement program and suggested using the term "National Highway System" in their place.

FHWA Response: MDOT is correct that the terms identified are no longer generally used. However, to ensure the clarity and applicability of Section 657.1, we chose to retain the terms because they are still used in 23 U.S.C. 141(a) and thus in 23 CFR 657.3, to define the extent of each state's enforcement obligation. We believe that using the term National Highway System, which did not exist on October 1, 1991, is not used in 23 U.S.C. 141 and is no longer identical to the highways systems listed in proposed Section 657.1, would generate substantial confusion.

Part 658 Section 658.5 Definitions Commercial Motor Vehicle

FHWA proposed to clarify that recreational vehicle movements, which include transportation to or from the manufacturer for customer delivery, sale or display

purposes, are not covered by the definition of commercial motor vehicle for the purposes of these regulations. Five commenters, including Former Congressman Bud Shuster, the National RV Dealers Association, the National Automobile Dealers Association (NADA), the Ohio State Police and the Illinois DOT, expressed support for the proposal to exclude recreational vehicles even when operated for a commercial purpose. Two commenters suggested that the section be clarified to include recreational vehicle dealers as well as manufacturers.

NADA and the Texas DOT raised concerns regarding what constitutes a recreational vehicle. Texas DOT asked whether travel trailers and companies that transport them were to be excluded as well. Additionally, NADA suggested that FHWA include a definition of recreational vehicle and the Ohio State Police requested a 3-year grace period for states to comply with any new definition.

FHWA Response: FHWA believes that the same rationale applies equally to recreational vehicle dealers and manufacturers. We are therefore including dealers as well as manufacturers in this provision. Further, it is our intent to include motorized vehicles operating under their own power used only for camping or other recreational activities in this provision.

However, we do not intend to exclude all third-party commercial entities that transport recreational vehicles from the width regulations. For example, a company that transports recreational vehicles via tow-bars or on a flat-bed on behalf of a dealer would not be exempt because the recreational vehicle, in this instance, becomes freight when not operated by its own power. This would also apply equally to travel trailers, which do not travel under their own power.

We do not believe that a grace period is necessary to comply with this rulemaking action because the change simply involves excluding certain vehicles from coverage by the width regulations and relieves the state agencies of the burden of enforcing these regulations against these vehicles.

Non-Divisible Load or Vehicle

The NPRM proposed to expand the definition of non-divisible load to include vehicles loaded with salt, sand, chemicals or a combination of these materials to be used in spreading the materials on any winter roads and when operating as emergency response vehicles. Four commenters expressed support for this proposal, citing the need for additional flexibility during poor weather conditions. The American Trucking Associations (ATA) opposed modifying the definition of non-divisible loads to include “military vehicle transporting marked military equipment or material.”

Further, ATA suggested that all emergency response vehicles should be eligible for classification as non-divisible loads. The American Association of State Highway Transportation Officials (AASHTO) also recommended that FHWA work with AASHTO to develop a proposed exception to the current non-divisible load requirement that would allow but not require a state to issue a permit to an overweight vehicle certified to be carrying an urgently needed disaster relief load during a declared emergency. MDOT, while supporting the proposal, asked whether a permit would be required as a result of this determination.

FHWA Response: FHWA believes that the limiting factors for the specific vehicles mentioned in the NPRM are adequate to ensure that they are used only during an emergency. Since the proposal would allow these vehicles to be considered non-divisible loads, no permit would be necessary.

The suggestions to create a more expansive definition to accommodate additional non-divisible loads during declared emergencies are beyond the scope of this rulemaking and therefore will not be addressed at this time. ATA’s opposition to the inclusion of “military vehicles transporting marked military equipment or material” in the definition of non-divisible loads is also outside the scope of this rulemaking. Such military vehicles were the subject of a previous rulemaking action, which is now finalized.

Drive-Away Saddle Mount Combination

FHWA proposed to amend 23 CFR 658.13(e)(1)(iii) to extend to 97 ft the length limit on drive-away saddle mount

combinations that are specifically designed to tow up to three trucks or truck tractors, each connected by a saddle to the frame or fifth wheel of the forward vehicle of the truck or truck tractor in front of it. This provision generated 22 comments. The comments focused on the wording of Section 4141 of SAFE TEA-LU, specifically whether or not the language was intended to include all saddle mount combinations in the new 97-ft limit or only those that include a fullmount. The question arose because of the title of the newly created 49 U.S.C. 31111(a)(4), “Drive-away saddle mount with fullmount vehicle transporter combination.” Section 4141 of SAFETEA-LU defined this term as “a vehicle combination designed and specifically used to tow up to 3 trucks or truck tractors, each connected by a saddle to the frame or fifth wheel of the forward vehicle of the truck or truck tractor in front of it.” The definition does not refer to a fullmount in the vehicle combination.

Several commenters expressed the view that the statutory language should be interpreted to include only saddle mounts with fullmount. Congressman David G. Reichert, AASHTO and the law firm of Schwerin Campbell Barnard LLP believe that the congressional language shows clear intent to limit the application of the law to saddle mount combinations “with fullmount.” In support of this position, several commenters expressed concerns about the safety of this configuration. Congressman Reichert noted that the “fullmount saddle mount vehicle had no wheels on the ground, which tends to make the entire vehicle combination more stable.”

This view was also shared by Schwerin Campbell Barnard LLP on behalf of General Teamsters Local 174, a Seattle-based affiliate of the International Brotherhood of Teamsters.

Additionally, AASHTO stated, “The legislated change in the rule governing saddle mount vehicles has raised serious concerns among some state enforcement officials concerning possible safety and infrastructure issues.” The California Department of Transportation asked about the scope of the legislation, specifically whether the new length regulations would apply on service access routes.

Additionally, FHWA received 20 general comments from individual Local 174 Teamster members, all expressing various

safety concerns with regard to FHWA’s interpretation and the proposed regulatory language.

Other commenters took the view that the language included, or was intended to include, all saddle mount combinations, with or without fullmount. In a July 18, 2006 letter to Maria Cino, Acting Secretary of the Department of Transportation, Congressman Don Young, Chair of the House Transportation and Infrastructure Committee, stated that the NPRM language “accurately reflects the congressional intent of Section 4141.” Congressman Young indicated that as Chair of this committee, he was directly involved in the development of this language during the 3 years leading up to passage of SAFETEA-LU. He further states, “It was our intention that the term ‘drive-away saddle mount vehicle transporter combination’ would include all saddle mount combinations, with or without fullmount.” Three other members of Congress also submitted letters stating their involvement in the development of the language and their support for the language as proposed in the NPRM.

The Automobile Carriers Conference (ACC) supported the proposed regulatory language and noted that the safety concerns expressed by other commenters were unfounded. ACC refers to a study prepared by the University of Michigan Transportation Research Institute (UMTRI) [“Consideration of an Increase in the Overall Length of Triple Saddle Mount Driveaway Combinations” (January 2006)].

Extensive studies have been performed that prove the safety of these combinations. Combinations up to 97 ft have a proven track record for complying with brake stopping distances as prescribed in FMCSR 393.52. According to the University of Michigan Transportation Research Institute, rollover threshold is virtually unaffected when increasing the length of a saddle mount combination from 75 ft. UMTRI goes on to state that the extended length saddle mount combination shows better rearward amplification than a corresponding 75-ft combination. UMTRI concludes that one could expect that the extended length saddle mount combination would exhibit improved handling, on the order of 23% reduction in rearward amplification, relative to a corresponding 75-ft combination.

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Final Rule to 23 CFR Parts 657 & 658

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Further, ACC states that “[s]ince the enactment of SAFETEA-LU, actual operational experience in the running [of] saddlemount combinations at [a] length up to 97 ft in the U.S. and parts of Canada have had no adverse impact on safety.” On behalf of JHT Holding, Holland and Knight agreed, noting “that after 107 million miles of saddlemount operations since the enactment of SAFETEA-LU, driveaway saddlemount combinations continue to experience a crash rate that is significantly less than the national average for large truck crashes in the U.S.”

FHWA Response: FHWA believes that the use of the words “with fullmount” in the section heading and in the term defined in the section is not dispositive of the matter. FHWA believes that it is important to examine the entire language of the provision and in particular, the statutory definition of the term itself, which are both necessary to make a reasonable interpretation of the congressional intent behind this provision.

FHWA believes that restricting this provision to saddlemounts with fullmount would ignore the express statutory definition used by the legislators, which is indicative of an intent to make the provisions of this section applicable to all saddlemount combinations. The definition contains no reference as to whether the saddlemount combination must contain a fullmount vehicle, which in effect makes the definition and therefore the provision, applicable to saddlemounts that contain a fullmount as well as those that do not.

The fact that the defined term contains the words “with fullmount” is not sufficient to override the definition itself, which makes no such limitations. This conclusion is supported by the letter from Congressman Young, Chair of the House Transportation and Infrastructure Committee, who indicates that he was involved in the development of the language in question, as well as letters from Congressmen Paul Ryan, Michael Burgess and Kenny Marchant.

In view of the above, FHWA maintains that its reading of the statute is reasonable and is retaining in this final rule the language proposed in the NPRM, which prohibits the states from enforcing an overall length limit of more or less

than 97 ft on driveaway saddlemount vehicle combinations with up to 3 towed units, with or without fullmount.

Definition of Over-the-Road Buses

FHWA proposed to incorporate into 23 CFR 658.5 a previously established definition of “over-the-road” buses found in 42 U.S.C. 12181(5).

The American Bus Association and Greyhound Lines Inc. stated that the NPRM’s definition of “over-the-road buses” was accurate and needed nothing further. However, these entities suggested that FHWA clarify that the definition of a “covered State” includes any state that enforced an axle weight limit described in the NPRM at any time described in the legislation. Both commenters suggested using the term “in” as opposed to “during” in the proposed language in Section 658.17(k) to clarify the statute and regulation.

FHWA Response: We agree. Section 115 of the Transportation, Treasury, Housing and Urban Development, the Judiciary, the District of Columbia and Independent Agencies Appropriations Act of 2006 (119 Stat. 2408) used the term “in” as opposed to “during” and is therefore correct. We also agree with the assertion that the proposed definition of “covered states” does include all states that enforced such a limit at any time during the specified period.

Section 658.13 Length

FHWA is amending the specialized equipment provision in Section 658.13(e)(1)(iii) to incorporate the statutory length limit that is now applicable to drive-away saddlemount vehicle transporter combinations. Additionally, FHWA is amending the definition to clarify that such combinations must comply with all applicable Federal Motor Carrier Safety Regulations, not just the provisions contained in 49 CFR Part 393.71.

Section 658.15 Width

NPRM proposed to amend 23 CFR 658.5 to eliminate any federal role in regulating the width of recreational vehicles while operating under their own power as commercial motor vehicles. FHWA is clarifying that recreational vehicle movements that include transportation under their own power to or from the manufacturer for customer delivery, sale or display pur-

poses are not covered by the definition of commercial motor vehicle. As such, we proposed to change Paragraph (c) to exempt recreational vehicles operating under their own power from width limitations. FHWA received no comments to this proposal and will retain the language proposed in the NPRM.

Section 658.17 Weight Over-the-Road Buses

The NPRM proposed to extend the temporary exemption granted by Congress for over-the-road buses until October 1, 2009 and to change the regulations to reflect the new 24,000 lb-axle weight mandated by Congress (Sec. 115, Pub. L. 109-115, 119 Stat. at 2408). Several states provided comments and questions regarding the applicability of the proposed regulations. The Texas Department of Public Safety and the California DOT asked several questions regarding the proposed language, the relationship of the exemption listed in Section 1309 of SAFETEA-LU and the language contained in the Transportation, Treasury, Housing and Urban Development, the Judiciary, the District of Columbia and Independent Agencies Appropriations Act of 2006. Specifically, the commenters asked whether either provision was mandatory for states and whether the 24,000 lb provision applied to the steering axle of a motorcoach.

Auxiliary Power Units

Comments related to the idle reduction systems or auxiliary power units (APU) focused on three general areas: whether the APU itself was limited to 400 lbs, how the regulation should be enforced and whether the states must allow the 400 lb tolerance contained in the statute.

Several commenters pointed out that the language proposed by FHWA would limit the weight of the auxiliary power unit to 400 lbs, which they believed to be inconsistent with the legislative language. They believe instead that the 400-lb limit related to the additional weight of the vehicle not to the APU itself.

Several state and industry groups expressed concern or asked how a state would enforce the 400-lb limit with regard to axle, tandem, gross weight and the bridge formula. How would a state determine load distribution? What documentation or proof would or should be necessary for compliance? What consti-

tutes proof that a unit is “fully functional at all times?” Additional concerns were raised with regard to the possibility of fraudulent certifications and APU look-alike devices that might allow additional freight in violation of the rule.

ATA stated that the NPRM was inconsistent with congressional intent by allowing states the option of allowing a gross weight limit, an axle weight limit exemption or both. ATA felt that “the regulation should make it clear that all States must allow the additional weight on gross, vehicle, axle and bridge formula limits. The regulation should also clarify that the additional authorized weight may be inclusive of or in addition to existing state weight enforcement tolerances.”

ATA, while agreeing with the weight certification requirement, also expressed concern that the proposed rule included fuel weight in the calculation of the APU’s weight. The Owner-Operators Independent Drivers Association (OOIDA) urged FHWA to be flexible in this area, suggesting that an acceptable certification would include a certificate from the manufacturer, other business records, certification by the weight of individual APU components (to allow for units that are self-manufactured) or a certified scale ticket representing vehicle weight before and after the unit is installed.

Commenters also expressed concern regarding the requirement that the APU be “fully functional at all times,” stating that they were unsure how such a requirement can be certified or documented and requested that FHWA clarify this issue. OOIDA suggested that the operator be able to satisfy this requirement verbally.

OOIDA and the Truck Manufacturers Association also believe that the certification requirement verifying the APU’s weight will eliminate most, if not all, enforcement concerns since the driver would gain no freight advantage while transporting a nonfunctioning unit. This would especially be true if the unit is temporarily broken. Further, OOIDA requested that the rule make it clear that a driver be required to make the necessary certifications only in response to the finding that the vehicle is overweight. Several respondents also requested that FHWA provide a list of manufacturers of these products and provide guidance to the states regarding enforcement.

Finally, several commenters asked

whether the states are required to adopt the 400-lb exemption.

FHWA Response: Over-the-Road Buses: Section 1309 of SAFETEA-LU is not preemptive. Its purpose is to allow the states to waive the axle weight limits on both transit and over-the-road buses at their discretion until October 1, 2009. The language in Section 115 of the Transportation, Treasury, Housing and Urban Development, the Judiciary, the District of Columbia and Independent Agencies Appropriations Act of 2006 (119 Stat. 2396, at 2408) is preemptive in

OOIDA and the Truck Manufacturers Association also believe that the certification requirement verifying the APU’s weight will eliminate most, if not all, enforcement concerns since the driver would gain no freight advantage while transporting a nonfunctioning unit.

nature but applies only to those States defined as “covered States.” If a state meets the definition of a covered state, it must adhere to the new provision on all individual axle weights, including the steering axle. It is important to note, however, that this legislation and the supporting regulation do not impair a state’s ability to weigh over-the-road buses. Further, the regulatory language only prohibits the citing of single-axle weight violations, not violations of the gross, tandem or other weight limits while on the interstate system.

Auxiliary Power Units

Section 756 of the Energy Policy Act of 2005 amended 23 U.S.C. 127(a) to allow an increase in the federal weight limits by up to 400 lbs to account for APUs installed in any heavy-duty vehicle (119 Stat. 594, at 829). The intent of this provision is to promote the use of technologies that reduce fuel consumption and emissions that result from engine idling.

We agree with several of the commenters and have adjusted the regulatory language accordingly. FHWA has revised the language to eliminate the weight requirement for the APU itself, while allowing up to a total of 400 lbs in axle, tandem, gross or bridge weight formula (which is an axle weight calculation), or the weight of the APU unit, whichever is less. For example, a vehicle equipped with an APU that has a certified weight of 750 lbs would be allowed the maximum of 400 lbs additional weight. However, a vehicle with an APU that has a certified weight of 300 pounds would be allowed a 300-lb exemption. This is consistent with the statutory language.

FHWA understands the concerns of enforcement agencies and users about the weight certification requirements. FHWA believes that certification of the APU’s weight must be in writing but can include a wide range of options, including a manufacturer’s certification (sticker, specification plate, etc), certified scale tickets listing the vehicle’s weight both before and after the unit’s installation, a component parts list with listed weights of each component if the unit is manufactured by the owner or operator, etc. so long as it accurately reflects the weight of the unit and is available to roadside enforcement officers. As for the inclusion of fuel in the overall weight calculation of the unit, we have concluded upon further consideration that the empty weight of the APU is more appropriate given that many of these units will use the truck tractor’s fuel supply.

The statutory requirement for a “demonstration or certification” that the unit is “fully functional at all times” is more problematic. We believe that a manual demonstration or a certification letter, which clearly states the unit’s operational characteristics if the unit is temporarily broken down, should provide sufficient proof. FHWA agrees with several commenters that there will be little or no incentive for a driver to install and transport a non-working APU. We also believe that there would be little need to require a driver to provide proof of weight and operability unless the vehicle is over the weight thresholds specified in the regulations. Additionally, we agree that the increased weight must be allowed in addition to any enforcement tolerances that are currently authorized under federal law.

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The Road Athlete System

By Mark Everest & Susan Shapiro

The Road Athlete System (RAS) is designed to educate drivers and staff on how to stay safe and healthy. Based on sound research, this program identifies the expensive healthcare premium and safety problems trucking companies face and offers a solution that could save them money and help their bottom lines.

Healthcare: Alarming Facts

Healthcare premiums have risen 87% over the last 6 years. In 2004, healthcare spending reached \$1.9 trillion or 16% of the gross domestic product and was projected to reach \$2.9 trillion during the next decade, nearly 20% of our gross domestic product. Health insurance expenses are the fastest-growing cost component for employers, even threatening to overtake the profits of some companies. Companies are now acting to keep their healthcare costs from becoming a larger part of their expenses. Most companies just hope the problem goes away, but hope is no business strategy.

The Problem

- Lifestyle can greatly reduce the life expectancy of a professional driver. Professional drivers may lose up to 20 years from their lifespan based on current expectancies, with evidence suggesting it could be as low as 57 years of age.

- Because of unhealthy lifestyle choices, professional drivers often have chronic illnesses such as cardiovascular disease, high blood pressure, diabetes and cancer. More than 90 million Americans presently live with these chronic illnesses.

- At least 60% of drivers are overweight or obese. Obesity in particular leads to many of the chronic illnesses.

- Truck drivers have a high incidence of stress, both personal and job-related, which results in lost workdays. National Safety Council estimates that 1 million employees are absent on an average workday because of stress-related problems.

- Truck drivers are particularly prone to back injury. Back injuries for the general public account for 22% of all disabling work injuries and close to 50% of workers' compensation costs. These figures are much higher in the trucking industry.

The Solution

Truck drivers have a unique set of issues related to their industry. They cannot just pick up any health-related material and integrate it into their lifestyle.

RAS addresses the truck driving culture and helps drivers to make changes realistic to their environment. It not only offers information to drivers, but it teaches them how to change their behavior. And health drives safety! By preventing just one minor accident and one injury, a double-digit return on investment could be achieved.

Occupational Athletics Health & Safety Systems of Harrisburg, PA. created and developed RAS. Occupational Athletics designs human maintenance systems to help ease the healthcare crisis of American workers and businesses. Unlike traditional wellness programs, The RAS Gamebook provides an interactive, entertaining and educational roadmap for trucking professionals to steer their way to a healthier lifestyle and increased safety, both on and off the road. The idea that we can all be athletes in life drives RAS. Just as professional athletes must develop specific skills to "play" at their best, so do professional truck drivers.

RAS seeks to enhance the well-being of individuals and employees who spend much time driving a motor vehicle. The front-end focus on driver "health" (prevention and wellness) versus the traditional back-end approach "healthcare" (premiums, deductibles, treatments, pills) is revolutionary in reducing employee injuries, illnesses and vehicle accidents in the transportation industry.

By using RAS, professional truck drivers can become involved in improving their own health and safety. They are "road athletes." Their playing field is the road and each workday is a new gameday with a new opportunity to achieve their goals.

The gamebook is easy to use. Every workday, for one year, drivers receive a lifestyle and safety factor along with short goals to achieve. Each factor is also accompanied by a "motor"-vator to increase their interest in these topics. These daily tips and "motor"-vators are concise, easy to understand and entertaining to read-day by day, step by step and goal by

goal. As drivers score their daily gameday goals, they become winners in the Game of Life. RAS enables truck drivers to exercise better control over their physical and mental well-being (lifestyle factors). And at the same time, they will gain greater safety awareness and know-how (safety factors).

RAS covers 12 lifestyle factors (one per month):

- 1) attitude and happiness;
- 2) disease prevention;
- 3) mental fitness;
- 4) motivation;
- 5) nutrition;
- 6) physical exercise;
- 7) relaxation;
- 8) sleep;
- 9) stress reduction;
- 10) substance abuse;
- 11) time management;
- 12) weight/obesity;

The program also covers six safety factors: 1) compliance; 2) driving regulations; 3) employee/employer relations; 4) injury prevention; 5) pre- and post-trip inspections; and 6) weather conditions.

The program includes:

- 12-month interactive gamebook;
- two audio CDs (more than 2 hours of training)—disc 1 contains a motivational talk by Mark Everest based on *The Gameplan for Aging, Your Four Quarters of Life*; disc 2 features a roundtable discussion with truck drivers, health providers and safety experts focusing on the lifestyle and safety of the professional driver;

- four quarterly utilization survey cards;
- laminated stretch card and ruler.

Other optional materials for training and program roll out include a train-the-trainer manual; training modules for RAS instructor certification; and PowerPoint presentation and script. ■

Mark Everest is the founder of Occupational Athletics. For the past 24 years, he has conducted seminars and training sessions for major transportation and insurance companies throughout the U.S.

Susan Shapiro is a member of the Occupational Athletics Health & Safety Systems' team. A health and wellness consultant, she has authored numerous health and safety books and publications.

The Road Athlete System is featured daily on the Dave Nemo Show, XM Satellite Radio Channel 171, "The Open Road" Truckers' Channel.

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- Evaluate and integrate new transportation SH&E management principles, controls and concepts into existing programs.
- Use case studies of other SH&E professionals to explore best practices in the transportation industry and develop insights for application on the job.
- Comply with transportation-related SH&E regulations, legislation, voluntary national consensus standards and other recommendations.
- Understand public policy that is important to SH&E professionals working in the transportation industry, and identify opportunities to become involved in further efforts related to these issues.
- Explore the ongoing impact of environmental and hazardous materials management for the transportation industry.



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Employee Selection & Training

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afford to ignore a major program that has such serious impacts on both personnel and budget. When a company realizes the costs associated with motor vehicle accidents, it will also realize that the costs associated with implementing a comprehensive fleet safety program are minimal by comparison. Developing a fleet safety program that includes aggressive driver selection and comprehensive training are key elements in preventing unnecessary and costly accidents.

A recent report by a major insurance company revealed that companies surveyed in its Executive Survey of Workplace Safety believe their companies receive a return-on-investment of \$3.00 or more for every \$1.00 spent on improving workplace safety. Those are numbers all companies can relate to when it comes to protecting employees. ■

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Fire & Explosion Investigations

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truck had .74V. The difference of .20V is negligible and will not create any unwanted results (Appendix D presents test data). As far as the ability to jump-start a dead battery, remote jump posts are employed to facilitate this concern.

Conclusion

This article brings to the attention of truck manufacturers, owners and drivers a solution that can mitigate a hazard. The design scheme described is not novel to the authors and is specifically to the credit of Freightliner Corp.

Investigators can also use this information when conducting fire cause and origin analysis of heavy trucks involved in collisions, as well as to show the mechanical fingerprints associated with this type of accident. Results of this investigation indicate unique fire cause and origin fingerprints in this type of occurrence and a technically feasible, economical and practical design alternative to mitigate it. ■

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Final Rule to 23 CFR

Parts 657 & 658

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It is important to note that Section 756 of the Energy Policy Act of 2005, which amended 23 U.S.C. 127 does not preempt state enforcement of its weight limits on all highways. Rather, it prevents FHWA from imposing funding sanctions if a state authorizes the 400-lb weight limit on their interstate system. Therefore, it remains for each state to decide whether it will allow the increased weight limits for APUs. However, a state must adhere to the provisions of Section 658.17 if it chooses to allow the additional weight.

Section 658.23 LCV Freeze: Cargo-Carrying Unit Freeze

The NPRM proposed to replace obsolete references to the Office of Motor Carriers with references to FHWA. In drafting the replacement regulatory text in the NPRM, FHWA inadvertently changed the word "must" to "may" in the last sentence of Subsection (c). We did not propose nor did we intend to change the substantive requirements contained in this subsection. FHWA did not receive any comments in response to the proposals contained in this section. Therefore, we have corrected the regulatory text to reflect the current regulatory requirements and to update the obsolete references to the Office of Motor Carriers.

For further information, contact William Mahorney, Office of Freight Management and Operations, (202) 366-6817, or Raymond Cuprill, Office of the Chief Counsel, (202) 366-0791, Federal Highway Administration, 400 7th St. SW, Washington, DC 20590. ■



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