



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: June 27, 2007

In reply refer to: H-07-1 through -3

Honorable John H. Hill
Administrator
Federal Motor Carrier Safety Administration
400 Seventh Street, S.W.
Washington, D.C. 20590-0001

On September 23, 2005, a 1998 Motor Coach Industries, Inc., 54-passenger motorcoach, operated by Global Limo Inc. (Global), of Pharr, Texas, was traveling northbound on Interstate 45 (I-45) near Wilmer, Texas.¹ The motorcoach, en route from Bellaire to Dallas, Texas, as part of the evacuation in anticipation of Hurricane Rita, was carrying 44 assisted living facility residents and nursing staff. The trip had begun about 3:00 p.m. on September 22. Fifteen hours later, about 6:00 a.m. on the following day, a motorist noticed that the right-rear tire hub was glowing red and alerted the motorcoach driver, who stopped in the left traffic lane and then proceeded to the right shoulder of I-45 near milepost 269.5. The driver and nursing staff exited the motorcoach and observed flames emanating from the right-rear wheel well. As they initiated an evacuation of the motorcoach, with assistance from passersby, heavy smoke and fire quickly engulfed the entire vehicle. Twenty-three passengers were fatally injured. Of the 21 passengers who escaped, 2 were seriously injured and 19 received minor injuries; the motorcoach driver also received minor injuries.

The National Transportation Safety Board determined that the probable cause of the accident was insufficient lubrication in the right-side tag axle wheel bearing assembly of the motorcoach, resulting in increased temperatures and subsequent failed wheel bearings, which led to ignition of the tire and the catastrophic fire. Global Limo Inc. had failed to conduct proper vehicle maintenance, to do pretrip inspections, and to complete posttrip driver vehicle inspection reports, thereby allowing the insufficient wheel bearing lubrication to go undetected. Contributing to the accident was the Federal Motor Carrier Safety Administration's ineffective compliance review system, which resulted in inadequate safety oversight of passenger motor carriers. Contributing to the rapid propagation and severity of the fire and subsequent loss of life was the lack of motorcoach fire-retardant construction materials adjacent to the wheel well. Also contributing to the severity of the accident was the limited ability of passengers with special needs to evacuate the motorcoach.

¹ For more information, see <<http://www.nts.gov/publictn/2007/HAR0701.pdf>>. National Transportation Safety Board, *Motorcoach Fire on Interstate 45 During Hurricane Rita Evacuation, Near Wilmer, Texas, September 23, 2005*, Highway Accident Report NTSB/HAR-07/01 (Washington, DC: NTSB, 2007).

During the investigation of this accident, the Safety Board compiled data in an attempt to examine the scope of motorcoach fires in the United States. The Safety Board gathered motorcoach and bus fire data from several sources, including Federal accident reporting databases such as the Fatality Analysis Reporting System (FARS) and the General Estimates System (GES) and other sources, including the Motor Carrier Management Information System (MCMIS) and the National Fire Protection Association (NFPA) vehicle fire database. In addition, the Safety Board was given access to insurance data from two companies and to the analyses performed by two large self-insured passenger-carrying motor carriers. Although these sources provided considerable data on motorcoach and bus fires, the databases do not cover the entire spectrum of bus fires. Local fire departments report vehicle fires to the States, and the States then report the data to the NFPA. However, the reporting requirements vary; and the definition of buses is broad, thus making it difficult even to search the NFPA data for information on motorcoach fires. Further, police agencies use the *Manual on Classification of Motor Vehicle Traffic Accidents*, which defines traffic accidents as involving motor vehicles in transport on a trafficway.² Motorcoach or bus fires that are not caused by vehicle collisions or do not originate while the vehicle is on the roadway are often not included in these databases. As a result, major highway safety accident data files, such as the FARS and GES, which collect data from police reports, do not capture the entire motorcoach or bus fire problem.

Other inconsistencies in fire reporting data are apparent as well. For example, the GES database listed only two motorcoach accidents from 1995–2003 that involved fires. The FARS data for 1994–2004 revealed 24 fatal motorcoach fires, a finding inconsistent with the GES data. Further, the MCMIS data from 1995–2005 reported 265 motorcoach fires, of which 4 involved fatalities.

The MCMIS accident file was developed to allow research on motor carrier safety problems and to potentially provide a census of all trucks and buses involved in traffic accidents. In 2002, the Safety Board noted the Federal Motor Carrier Safety Administration's (FMCSA's) acknowledgement that not all accidents were reported for inclusion in the MCMIS,³ even though the accident file is intended to be a census of fatal injury- and property damage-only accidents. Although the accident file contains State-supplied data from police reports involving drivers and vehicles of all motor carriers operating in the United States, an FMCSA evaluation of the database found that the overall reporting level of fatal and nonfatal involvements was lower than expected for both trucks and buses, at 63 percent and 44 percent, respectively. As a result, the FMCSA has contracted with the University of Michigan Transportation Research Institute to monitor and evaluate improvements in accident reporting by the States and resulting effects on the quality of MCMIS data.

² American National Standards Institute, *Manual on Classification of Motor Vehicle Traffic Accidents*, ANSI D16.1-1996, Section 2.4.18 (Washington, DC: ANSI, 1996).

³ National Transportation Safety Board, *Analysis of Intrastate Trucking Operations*, Safety Report NTSB/SR-02/01 (Washington, DC: NTSB, 2002).

At the Safety Board public hearing on this accident investigation, August 8–9, 2006, in Washington, D.C.,⁴ the FMCSA reported that it has recognized the difficulty in obtaining meaningful motorcoach and bus fire data and has contracted with the Volpe National Transportation Systems Center to gather data and studies relating to motorcoach fires, set up a database or spreadsheet system to structure the data, and analyze the motorcoach and bus fire problem, including causes, frequency, and severity.⁵ Although the Safety Board supports this initiative and looks forward to the anticipated completion of the Volpe study in March 2007, the Board is concerned that the gathering and analysis of bus and motorcoach fire data by the FMCSA Volpe contract will not provide for *ongoing* statistical compilation and study. The Safety Board concludes that continuing analysis of motorcoach and bus fire data is vital to understanding not only the trends in these vehicle fires, but also the success or shortcomings of measures taken by the Government and private industry to address this problem.

Global did not retain vehicle maintenance and repair records as required by the *Federal Motor Carrier Safety Regulations* (FMCSRs). Although Global had been subleasing the motorcoach for a few months prior to the accident and had conducted some repairs and one preventative maintenance servicing, it did not have in place any maintenance program to properly service the vehicle. Without pretrip inspections or the required driver vehicle inspection reports (DVIRs), Global could not ensure that the vehicle was safe to operate on a daily basis.

The absence of maintenance and repair records prevents verification that vehicles are properly inspected and maintained. For several years before the accident, Global had failed to properly maintain repair records and provide routine maintenance servicing for its motorcoaches. On April 10, 2002, the Texas Department of Public Safety (TxDPS) conducted an intrastate educational review of Global and found the company to be in violation for failing to maintain vehicle inspection and maintenance records. When the FMCSA conducted a 2004 compliance review, Global was cited for violating 49 *Code of Federal Regulations* (CFR) 396.3(b)(2) because the carrier did not have a means of indicating the nature and date of inspection and maintenance operations that were performed on its vehicles. When the FMCSA conducted a postfire compliance review on October 7, 2005, Global was cited for failing to inspect and maintain vehicles to ensure safe and proper operating conditions. Based on this compliance review, the FMCSA served Global with an operations out-of-service (OOS) order, stating: “Global Limo has a grossly ineffective or nonexistent inspection, repair, and maintenance program.”

The accident motorcoach had received preventative maintenance service once while being operated by Global. When interviewed, the accident driver stated that he did not conduct pretrip inspections and did not check the oil level in the hub cavity. Global’s owner stated that he did not pay drivers to conduct pretrip or posttrip vehicle inspections. Because they did not

⁴ “Motorcoach Accident and Selected Federal Motor Carrier Safety Administration Oversight Issues, Wilmer, Texas.” The Safety Board may hold a public hearing as part of its investigation into an accident to supplement the factual record. Technical experts are called as witnesses to testify, and Board investigative staff and designated representatives from the parties to the investigation ask questions to obtain additional factual information. A hearing is not intended to analyze factual information for cause.

⁵ U.S. Department of Transportation, Research and Innovative Technology Administration, *Motor Coach Fire Safety Analysis Work Plan*, Project No. CV702 (Cambridge, MA: Volpe National Transportation Systems Center, 2006).

conduct posttrip inspections and complete the DVIRs, as required by the FMCSA, neither the driver nor the carrier was alerted to potential vehicle defects requiring maintenance or repair.

The accident vehicle maintenance manual specifies that hub oil levels need to be checked daily. Some motorcoach models have a “sight glass” that allows observation of the oil level in the hub cavity; though the glass often becomes obscured and prevents an accurate view of oil levels, it can be cleaned or replaced. A wheel seal leak on a tag axle, however, can be observed only by inspecting the inside of the wheel for oil from a position underneath the motorcoach. The current design of the tag axle wheel hub makes it difficult for a roadside safety inspector to check for a wheel seal leak without an undercarriage vehicle inspection. The Safety Board concludes that because neither Global nor its employees routinely inspected the hub oil level or undercarriage of the wheel well, they did not discover the lack of lubrication of the tag axle wheel bearings; and this disregard for vehicle maintenance, pretrip inspections, and posttrip DVIRs led to a wheel bearing failure that resulted in a catastrophic fire and loss of life.

Although manufacturers recommend checking the wheel bearing lubricating oil levels daily, drivers are not specifically required to do so during a pretrip or posttrip inspection. However, proper routine maintenance would reveal inadequate hub oil levels or verify the absence of a wheel seal leak. Moreover, though neither roadside nor annual periodic inspections require checking the sight glass or the wheels for a leak, 49 CFR 396.3 specifies, “Every motor carrier shall systematically inspect, repair, and maintain, or cause to be systematically inspected, repaired, and maintained, all motor vehicles subject to its control.” The regulations go on to state, under 396.5, “Every motor carrier shall ensure that each motor vehicle subject to its control is: (a) properly lubricated; and (b) free of oil and grease leaks.” Title 49 CFR 393.205 addresses the parts and accessories for safe operation of wheels and sets forth additional requirements for wheel seal and other hub leaks.

The industry acknowledges that a motorcoach tire fire is the most difficult to extinguish; though detection systems may alert a driver to a potential fire situation, adequate suppression systems are not yet available. Therefore, fire prevention is the key objective. The FMCSA has established specific OOS criteria for commercial vehicles in response to safety hazards, and it is the appropriate agency to require that commercial vehicles maintain proper wheel bearing lubrication to prevent failure and possible catastrophic tire fires.

A comprehensive program of proper maintenance by motor carriers, pretrip inspections, posttrip vehicle inspections by drivers, State and Federal requirements, and inspections to verify motor carrier compliance with safety regulations is necessary to prevent motorcoach fires. However, no regulations are in place that set inspection requirements for wheel bearings and wheel seal leaks. According to the FMCSA, the Volpe Center will assess the adequacy of current motorcoach operational inspection practices, both daily and periodic, as they relate to detecting and remedying situations that may lead to a fire.⁶ The Safety Board concludes that Federal regulations and inspection criteria do not require inspection of wheel bearings and adequate lubrication to prevent wheel bearing failure and a resulting wheel well fire.

⁶ *Motorcoach Fire Safety Analysis Work Plan.*

On April 10, 2002, a TxDPS intrastate educational review of Global uncovered numerous driver and vehicle safety violations. In February 2004, an FMCSA compliance review of Global found similar violations of the FMCSRs pertaining to commercial drivers and vehicles, though the final safety rating for the carrier was satisfactory. After the Wilmer accident in September 2005, when the FMCSA conducted a second compliance review of Global, it issued the company a safety rating of unsatisfactory, declared that Global's operations created an "imminent hazard" to public safety, and issued an operations OOS order. The order was based on Global's numerous driver qualification violations and FMCSA documentation of Global's lack of vehicle maintenance, inspection, and repairs, which resulted in vehicles that were mechanically unsafe. The OOS order stated that Global's pattern of FMCSR violations was consistent in nature and long in history. Although the February 2004 compliance review had documented many of the same safety violations as the postaccident compliance review 19 months later, the FMCSA issued a different final rating of Global, an unsatisfactory rating.

At the time of the accident, Global was not providing proper safety oversight of its operations. The accident driver had been working for Global without being properly licensed to drive a motorcoach in the United States, and after the accident, Global failed to conduct the postaccident alcohol and illicit drug testing required by the FMCSRs. Further, Global had been operating a passenger-carrying commercial vehicle that had an expired temporary trip permit tag and was not registered in the United States, was displaying the license plate from another vehicle, and had not been systematically maintained. In light of these findings, as well as the violations found by the FMCSA during the postaccident compliance review, the Safety Board concludes that Global exhibited a lack of concern for safety management controls by violating several Federal safety regulations pertaining to its drivers and vehicles, including employing a driver who was not properly licensed to drive a motorcoach in the United States; failing to conduct the required postaccident alcohol and illicit drug testing; and operating a passenger-carrying commercial vehicle, with an expired temporary trip permit tag, that was not registered in the United States, was displaying the license plate from another vehicle, and had not been systematically maintained. This accident is one of many in which the Safety Board has focused on FMCSA safety oversight of motor carriers and has found inconsistencies based on a safety rating process that fails to ensure the removal of unsafe motor carriers from the Nation's highways.⁷

In reviewing the FMCSA's safety rating system within the compliance review process, the Safety Board has found the rating methodology inadequate in two areas:

- It considers only those violations defined by the FMCSA as "critical" or "acute" in determining a carrier's overall safety rating, and
- It does not factor in a carrier's driver's rate of OOS orders and does not fully review vehicle inspection data.

⁷ (a) National Transportation Safety Board, *Motorcoach Run-off-the-Road and Overturn, Victor, New York, June 23, 2002*, Highway Accident Report NTSB/HAR-04/03 (Washington, DC: NTSB, 2004). (b) National Transportation Safety Board, *Collision Between Truck-Tractor Semitrailer and School Bus Near Mountainburg, Arkansas, May 31, 2001*, Highway Accident Report NTSB/HAR-02/03 (Washington, DC: NTSB, 2002). (c) National Transportation Safety Board, *Selective Motorcoach Issues*, Special Investigation Report NTSB/SIR-99/01 (Washington, DC: NTSB, 1999).

The FMCSA compliance review uses a computer tabulation program to identify adherence to the FMCSRs for each rating factor, placing weighted numerical value only on violations of acute or critical regulations. Unrated violations—those that are noncritical or nonacute—are not given weight and therefore are not factored⁸ into the tabulation; the FMCSA does not consider a motor carrier's violations of many FMCSRs to be an indication of safety management practices. In other words, if a carrier displayed a pattern of 100 percent noncompliance for every nonrated safety regulation violation, its overall safety rating would not be affected. This rating methodology is inconsistent with the FMCSA's stated purpose of the compliance review, which is to make sure that a motor carrier has adequate safety management controls in place to ensure compliance with all applicable Federal safety requirements.

The Volpe Center reported that for the year 2005, the FMCSA performed 8,097 Federal compliance reviews, during which a total of 61,924 violations of Federal safety regulations were found.⁹ However, only 1,758 violations were classified "acute," and 7,102 were classified "critical"—which is to say that 85.7 percent of Federal safety regulations violations discovered in 2005 did not carry any weight against the carriers' safety ratings. Further, 65 percent of the 8,097 Federal compliance reviews conducted resulted in satisfactory ratings for the carriers, though 53,069 "other" (nonacute and noncritical) violations (85.7 percent) of Federal safety regulations were documented. The FMCSA documented violations in 7,831 (96.7 percent) of the compliance reviews.

At the Safety Board public hearing, the FMCSA field administrator stated that the agency is working with the Volpe Center to develop a risk model for all FMCSRs to make a determination as to whether a violation should be "critical" or "acute" for a compliance review safety determination. Although this study is a step in the right direction, the Safety Board has long taken the position, as expressed in its reports cited earlier, that violations of safety regulations are an indication of a motor carrier's lack of safety management controls. The Safety Board concludes that the FMCSA's compliance review program does not assign numerical value to safety regulation violations that are classified as neither "acute" nor "critical" during the safety fitness rating process, thereby allowing potentially unsafe carriers, which violate safety regulations without consequence, to continue operating.

The two most important factors in safe motor carrier operations are the operational status of the vehicles (trucks or buses) and the performance of the individuals who drive them. However, the FMCSA compliance review process does not accurately determine a motor carrier's safety fitness because it does not factor in the rate of a carrier's driver OOS orders from roadside inspections, and it includes only a limited amount of vehicle inspection data. Increasing the weight of performance data for driver and vehicle factors in compliance reviews is important because deficiencies in these factors are directly related to accidents. In previous accident investigations, the Safety Board has found that several unsafe carriers were permitted to continue operating as a result of a final satisfactory safety rating regardless of driver- or vehicle-related

⁸ When asked during the Safety Board public hearing on this accident about how the FMCSA determines whether an FMCSR violation by a motor carrier is acute, critical, or unrated, an FMCSA field administrator stated that the agency determines certain regulations to be critical or acute depending on the relative risks of an accident (whether violation of those particular regulations would place a carrier at risk for an accident).

⁹ See Motor Carrier Management Information System March 31, 2006, snapshot on FMCSA's website, October 20, 2006.

safety violations. On June 15, 2006, the FMCSA briefed the Safety Board on the Comprehensive Safety Analysis (CSA) 2010 Initiative, which the agency indicated will include a complete evaluation of the compliance review process, leading to development of a new performance-based operational model for determining motor carrier safety, with emphasis on preventative measures and early detection of unsafe driver and carrier conditions.

At the August 2006 Safety Board public hearing, the FMCSA stated that it is reviewing the compliance review process and safety rating methodology. The FMCSA explained that when it originally promulgated the safety fitness determination process, the driver OOS rate information was found to be insufficient to accurately determine a driver's safety performance; however, the FMCSA's current goal is to develop a data-driven safety fitness determination process, which includes items such as vehicle and driver OOS rates, as part of its comprehensive examination of compliance review and enforcement oversight. Additionally, in September 2006, the FMCSA reported that it is developing a new safety fitness rating methodology based on an objective measure of driver or carrier safety performance data and will issue ratings on all drivers and carriers for which there are sufficient data. According to the CSA 2010 Initiative website, the deployment date of the new operational model is year 2010. The FMCSA plans to develop and draft legislation required for the program; rulemaking within the FMCSA takes at least 2 years. Pilot testing is projected to begin in 2008; pilot tests and training for deployment and implementation are expected to take at least 2 years and thus may extend well beyond 2010.

Concerned that motor carriers with significant regulatory violations for drivers and vehicles are still receiving satisfactory ratings, the Safety Board once more focuses on Federal standards for determining the safety fitness of carriers. As it has done in several accident investigations in the past 8 years, the Safety Board again concludes that the current FMCSA compliance review process does not effectively identify unsafe motor carriers and prevent them from operating.

Although the FMCSA has stated that the conceptual model for CSA 2010 is significantly different from the current operational model in that safety fitness determinations will be independent of the compliance review, the expected time frame for implementation of the new program is at least several more years. In the interim, deficiencies in the current compliance review system should be remedied to help prevent unsafe carriers from continuing to operate. The FMCSA is responsible for ensuring that motor carriers operate safely, and temporary measures to improve the compliance review process may be necessary until new rules are enacted. The FMCSA has already set a precedent for the issuance of interim rules to improve safety programs; in 1997, the agency issued an interim final rule to immediately improve the safety rating methodology without prior notice and comment, stating that to have done otherwise would have been contrary to the public interest.

The National Transportation Safety Board therefore makes the following recommendations to the Federal Motor Carrier Safety Administration:

Establish a process to continuously gather and evaluate information on the causes, frequency, and severity of bus and motorcoach fires and conduct ongoing analysis of fire data to measure the effectiveness of the fire prevention and mitigation

techniques identified and instituted as a result of the Volpe National Transportation Systems Center fire safety analysis study. (H-07-1)

Revise the *Federal Motor Carrier Safety Regulations* at 49 CFR 393.205 to prohibit a commercial vehicle from operating with wheel seal or other hub lubrication leaks. (H-07-2)

To protect the traveling public until completion of the Comprehensive Safety Analysis 2010 Initiative, immediately issue an Interim Rule to include all *Federal Motor Carrier Safety Regulations* in the current compliance review process so that all violations of regulations are reflected in the calculation of a carrier's final rating. (H-07-3)

With regard to Safety Recommendation H-07-3, the Safety Board asks that the FMCSA issue the Interim Rule within 90 days.

As a result of this accident investigation, the Safety Board also issued new safety recommendations to the National Highway Traffic Safety Administration, the Pipeline and Hazardous Materials Safety Administration, the Fraternal Order of Police, the International Association of Chiefs of Police, the International Association of Fire Chiefs, the International Association of Fire Fighters, the National Association of State EMS Officials, the National Sheriffs' Association, the National Volunteer Fire Council, Motor Coach Industries, Inc., and other motorcoach manufacturers, the United Motorcoach Association, and the American Bus Association. In addition, the Safety Board reiterated two recommendations to the U.S. Department of Transportation.

Please refer to Safety Recommendations H-07-1, -2, and -3 in your reply. If you need additional information, you may call (202) 314-6177.

Chairman ROSENKER, Vice Chairman SUMWALT, and Members HERSMAN, HIGGINS, and CHEALANDER concurred in these recommendations. Member HERSMAN filed a concurring statement, and Member HIGGINS filed a concurring and dissenting statement, both of which are attached to the Accident Report.

[Original Signed]

By: Mark V. Rosenker
Chairman