



# National Transportation Safety Board

Washington, D.C. 20594

## Safety Recommendation

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**Date:** October 21, 2010

**In reply refer to:** H-10-16

Mr. Jerry Garland  
Chief Executive Officer and President  
Associated Wholesale Grocers, Inc.  
5000 Kansas Avenue  
Kansas City, Kansas 66106

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The National Transportation Safety Board (NTSB) is an independent Federal agency charged by Congress with investigating transportation accidents, determining their probable cause, and making recommendations to prevent similar accidents from occurring. We are providing the following information to urge your company to take action on the safety recommendation in this letter. The NTSB is vitally interested in this recommendation because it is designed to prevent accidents and save lives.

This recommendation addresses fatigue education, information, and management. The recommendation is derived from the NTSB's investigation of a highway accident that took place on June 26, 2009, when one of your truck-tractor semitrailers collided with passenger vehicles on Interstate 44 (I-44) near Miami, Oklahoma,<sup>1</sup> and is consistent with the evidence we found and the analysis we performed. As a result of this investigation, the NTSB has issued nine safety recommendations, one of which is addressed to Associated Wholesale Grocers, Inc. (AWG). Information supporting this recommendation is discussed below. The NTSB would appreciate a response from you within 90 days addressing the actions you have taken or intend to take to implement our recommendation.

On June 26, 2009, a multivehicle accident occurred on I-44 near Miami, Oklahoma, shortly after a minor accident in the same vicinity occurred. The minor accident took place about 1:13 p.m., when a 2001 Ford Focus traveling eastbound at milepost 321.7 on I-44 drifted into a truck-tractor semitrailer parked on the right shoulder. After the Focus sideswiped the semitrailer, the car's driver overcorrected to the left, lost control, and struck the concrete center median barrier. The Focus came to rest in the roadway, blocking the left eastbound lane. As the trailing traffic began to slow and stop, it formed a queue. Several motorists exited their vehicles and

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<sup>1</sup> For additional information, see *Truck-Tractor Semitrailer Rear-End Collision Into Passenger Vehicles on Interstate 44, Near Miami, Oklahoma, June 26, 2009*, Highway Accident Report NTSB/HAR-10/02 (Washington, DC: National Transportation Safety Board, 2010), which is available on the NTSB website at <http://www.nts.gov/publicctn/2010/HAR1002.pdf>.

began to push the disabled Focus to the right shoulder. The queue of stopped vehicles and approaching but slowing vehicles extended back from the accident site approximately 1,500 feet to about milepost 321.5.

Meanwhile, about 1:19 p.m., a 76-year-old AWG truck driver operating a 2008 Volvo truck-tractor in combination with an empty 2009 Great Dane refrigerated semitrailer was traveling eastbound in the outside (right) lane of I-44 at approximately 69 mph. (The posted speed limit was 75 mph.) The truck driver did not react to the queue of slowing and stopped vehicles and collided with the rear of a 2003 Land Rover sport utility vehicle (SUV). As both vehicles moved forward, the Land Rover struck a 2003 Hyundai Sonata and then departed the right lane and shoulder, coming to rest off the roadway. The Volvo continued forward, struck and overrode the Hyundai Sonata, struck and overrode a 2004 Kia Spectra, and then struck the rear of a 2000 Ford Windstar minivan. The Volvo overrode a portion of the Windstar while pushing it into the rear of a livestock trailer being towed by a 2004 Ford F350 pickup truck. The Ford pickup truck was pushed forward and struck a 2008 Chevrolet Tahoe SUV. The Volvo combination unit came to rest approximately 270 feet past the point where it initially struck the Land Rover. As a result of the Volvo combination unit's striking the slowed and stopped vehicle queue on I-44, 10 passenger vehicle occupants died, 5 received minor-to-serious injuries, and the driver of the Volvo combination unit was seriously injured.

The National Transportation Safety Board determined that the probable cause of this accident was the Volvo truck driver's fatigue, caused by the combined effects of acute sleep loss, circadian disruption associated with his shift work schedule, and mild sleep apnea, which resulted in the driver's failure to react to slowing and stopped traffic ahead by applying the brakes or performing any evasive maneuver to avoid colliding with the traffic queue. Contributing to the severity of the accident were the Volvo truck-tractor combination unit's high impact speed and its structural incompatibility with the passenger vehicles.

Among the issues the NTSB addressed during this accident investigation were the need for updated and comprehensive fatigue education materials and the importance of fatigue management programs.

### **Fatigue Education and Information**

The NTSB has long been concerned about how fatigue affects all transportation operators, including commercial truck and bus drivers. In 1990, the NTSB completed a study of 182 heavy truck accidents that were fatal to the truck driver.<sup>2</sup> The NTSB's primary purpose in investigating fatal-to-the-truck-driver accidents was to assess the role of alcohol and other drugs in these accidents. The study found, however, that the most frequently cited probable cause in such accidents was fatigue.

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<sup>2</sup> *Fatigue, Alcohol, Other Drugs, and Medical Factors in Fatal-To-The-Driver Heavy Truck Crashes (Volume 1)*, Safety Study NTSB/SS-90/01 (Washington, DC: National Transportation Safety Board, 1990).

In a subsequent safety study that focused on fatigue's role in heavy truck accidents,<sup>3</sup> the NTSB recommended that the Federal Highway Administration (FHWA),<sup>4</sup> in cooperation with the American Trucking Associations, Inc. (ATA), the Professional Truck Driver Institute, the Commercial Vehicle Safety Alliance (CVSA), and the National Private Truck Council, take the following action:

Develop and disseminate, in consultation with the U.S. Department of Transportation Human Factors Coordinating Committee, a training and education module to inform truck drivers of the hazards of driving while fatigued. It should include information about the need for an adequate amount of quality sleep, strategies for avoiding sleep loss such as strategic napping, consideration of the behavioral and physiological consequences of sleepiness, and an awareness that sleep can occur suddenly and without warning to all drivers regardless of their age or experience. (H-95-5)

The FHWA Office of Motor Carriers distributed pamphlets; worked with the Owner-Operator Independent Drivers Association, the CVSA, and the National Private Truck Council on this issue; and sponsored the DOT 1995 Truck and Bus Summit. It also funded the ATA to adapt the sleep education and training module developed by the National Aeronautics and Space Administration to the motor carrier industry and to identify, evaluate, and select recommended management practices for determining which drivers are at higher risk of accidents and safety violations and for developing means of appropriately modifying driver behavior. The development and distribution of brochures, manuals, and videotapes, such as "The Alert Driver: A Trucker's Guide to Sleep, Fatigue, and Rest in Our 24-Hour Society," "Awake at the Wheel," "Fatigue and the Truck Driver," and "Dealing with Truck Driver Fatigue," publicized the importance of the issue of fatigue. The FHWA stated that it would continue its educational activities and that the strategic plan for its Office of Motor Carriers (predecessor entity to the FMCSA) would include educational and informational approaches. Safety Recommendation H-95-5 was classified "Closed—Acceptable Action" on July 7, 1998, due to the agency's work with various organizations to educate drivers about the dangers of drowsy driving.

When NTSB investigators reviewed the training material that AWG provided its drivers on fatigue, they found only the VHS videotape "The Alert Driver: A Trucker's Guide to Sleep, Fatigue, and Rest in Our 24-Hour Society," which was released in 1996 by the ATA, in partnership with the FHWA Office of Motor Carriers (since succeeded by the FMCSA). Although the video provides valuable guidelines for truck drivers regarding the importance of sleep, the cognitive effects of sleepiness, and the best strategies to reduce fatigue related to shift work, some of the information provided is outdated, and the video does not include vital fatigue-related facts and guidance. For example, the video references obsolete hours-of-service regulations; the FMCSA significantly revised these regulations in April 2003, limiting driving to 11 hours within a 14-hour, nonextendable period after coming on duty following 10 consecutive

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<sup>3</sup> *Factors That Affect Fatigue in Heavy Truck Accidents, Volume 1: Analysis*, Safety Study NTSB/SS-95/01 (Washington, DC: National Transportation Safety Board, 1995).

<sup>4</sup> Within the U.S. Department of Transportation (DOT), the Federal Motor Carrier Safety Administration (FMCSA) subsequently became responsible for these areas of concern.

hours off duty (known as the 11-hour rule).<sup>5</sup> The video also does not mention the risk factors for obstructive sleep apnea (OSA), which is a significant omission, given the prevalence of these factors among commercial drivers.<sup>6</sup> Further, the driver fatigue video does not mention the importance of maintaining one's health and diet to reduce fatigue.<sup>7</sup> Research has revealed how a health and wellness regimen can reduce the risk factors that may lead to fatigue and drowsiness.<sup>8</sup> A booklet that accompanies the video includes some information on health maintenance and OSA risk factors; however, because the video is the primary mode of information dissemination, the relegation of this information to a supplementary booklet makes it less likely that it will be seen and heeded by truck drivers.

In addition, the 1996 video provides questionable strategies for truck drivers to follow in combating sleepiness, such as chewing gum, eating sunflower seeds, turning on the radio, and rolling down the window.<sup>9</sup> However, on its website, the FMCSA has discouraged the use of such "alertness tricks," stating that they are not "real cures for drowsiness and may give you a false sense of security."<sup>10</sup>

Although employee education concerning fatigue is extremely valuable, the provision of information alone is insufficient to constitute an adequate fatigue management program, which should involve all aspects of a carrier's operation.

### **Fatigue Management Programs**

A fatigue management program is a system<sup>11</sup> designed to take a comprehensive, tailored approach to the issue of fatigue within an industry or a workplace and to address the problem of

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<sup>5</sup> Although the rules concerning weekly limits for on-duty time remained unchanged, drivers were allowed to restart the weekly limit calculation after they took 34 consecutive hours off duty (known as the 34-hour restart provision). The rule also extended the requisite off-duty time from 8 to 10 hours, providing drivers more time for restorative rest.

<sup>6</sup> (a) R. Stoohs and others, "Sleep and Sleep-Disordered Breathing in Commercial Long-Haul Truck Drivers," *Chest*, vol. 107, no. 5 (1995), pp. 1275–1282. (b) H. Häkkinen and H. Summal, "Sleepiness at Work Among Commercial Truck Drivers," *Sleep*, vol. 23, no. 1 (2000), pp. 49–57.

<sup>7</sup> (a) J. Brock and others, *Commercial Truck and Bus Safety Synthesis 7: Motorcoach Industry Hours of Service and Fatigue Management Techniques* (Washington, DC: Transportation Research Board, 2005). (b) *Fatigue Survey of BC Truck Drivers* (WorkSafeBC, December 2005), <[http://www2.worksafebc.com/pdfs/forestry/truck\\_driver\\_fatigue\\_survey\\_final.pdf](http://www2.worksafebc.com/pdfs/forestry/truck_driver_fatigue_survey_final.pdf)> (accessed June 8, 2010). (c) D. Wiegand, R. Hanowski, and S. McDonald, *Commercial Motor Vehicle Health and Fatigue Study Final Report*, 09-UF-002 (Blacksburg, Virginia: National Surface Transportation Safety Center for Excellence, February 11, 2009).

<sup>8</sup> (a) R. Stoohs and others. (b) H. Häkkinen and H. Summal. (c) *Fatigue Survey of BC Truck Drivers*.

<sup>9</sup> A witness stated that the Volvo cab's driver-side window was rolled down at the accident scene, despite the temperature being above 100 °F. This was confirmed in postaccident scene photos. However, it is not known whether the window was opened before or immediately following the accident.

<sup>10</sup> See <<http://www.fmcsa.dot.gov/about/outreach/education/driverTips/Driver-fatigue.htm>> (accessed November 3, 2009).

<sup>11</sup> Fatigue management systems can also be referred to as fatigue management plans, fatigue risk management programs, fatigue management schemes, fatigue countermeasures programs, and alertness management programs. For the purposes of this letter, the term "fatigue management program" will be used when referring generically to such systems.

fatigue in an operational environment. Commonly, a fatigue management program would incorporate individual program-focused efforts to help manage fatigue (for example, policies and practices addressing scheduling;<sup>12</sup> attendance; employee education, medical screening, and treatment; personal responsibility during nonwork periods; task/workload issues; rest environments; and commuting and/or napping) as well as an overall organizational strategy for implementing, supervising, and evaluating the plan. Many motor carriers have developed and put into action their own fatigue management programs, although the extent and nature of the plans vary widely.

AWG operates around the clock and its drivers work on shift schedules, yet the NTSB found no evidence that the carrier had taken any companywide action to minimize the occurrence of fatigued driving. Apart from including the outdated “Alert Driver” video in its training library, AWG did not have any program in place to prepare and educate its dispatchers, managers, and drivers to deal with the fatigue-related consequences of its shift work operations. The NTSB concludes that AWG did not have a meaningful fatigue management program in place at the time of the accident.

The FMCSA is currently collaborating with Transport Canada and others on the development of the North American Fatigue Management Program (NAFMP), which will provide companywide guidelines for the management of fatigue in a motor carrier operating environment. The NAFMP guidelines are envisioned to promote the following elements: (1) corporate change processes, including the involvement and support of management, (2) modifications to scheduling policies and practices, (3) companywide fatigue management training, (4) sleep disorder screening and treatment for drivers, and (5) fatigue-monitoring technologies and alertness strategies. The NAFMP fatigue management guidelines are anticipated to be available within the next 2 years; they will be applicable to all motor carrier operations, industrywide, regardless of size.

Because of the complex nature of the factors that contribute to fatigue, not only has the NTSB issued safety recommendations regarding fatigue in all modes, but it has also supported industry initiatives led by the DOT to develop practical fatigue management tools for the transportation industry.<sup>13</sup> For example, in the late 1990s, the DOT’s Human Factors Coordinating Committee, a group consisting of representatives from the Federal Aviation Administration (FAA) and other transportation modal administrations, sponsored an Operator Fatigue Management (OFM) Program.<sup>14</sup> The program resulted in several products, including a practical

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<sup>12</sup> Scheduling policies and practices could include written policies and/or the use of fatigue-modeling software tools to assist in roster development.

<sup>13</sup> (a) *Collision With Trees on Final Approach, Federal Express Flight 1478, Boeing 727-232, N497FE, Tallahassee, Florida, July 26, 2002*, Aircraft Accident Report NTSB/AAR-04/02 (Washington, DC: National Transportation Safety Board, 2004). (b) *Collision with Trees and Crash Short of Runway, Corporate Airlines Flight 5966, British Aerospace BAE-J3201, N875JX, Kirksville, Missouri, October 19, 2004*, Aircraft Accident Report NTSB/AAR-06/01 (Washington, DC: National Transportation Safety Board, 2006).

<sup>14</sup> This program was established as part of the “ONEDOT” program to coordinate resources among DOT agencies. One of the goals of the effort was to reduce the number of accidents and injuries related to operator fatigue.

guide addressing fatigue management and countermeasure usage<sup>15</sup> and work schedule representation and analysis software to aid managers and schedulers in evaluating and designing work schedules and procedures for validating the output of fatigue-modeling tools. In response to Safety Recommendation A-06-11, which the NTSB issued to the FAA in its report on the Kirksville, Missouri, aircraft accident,<sup>16</sup> on April 28, 2006, the FAA issued *Safety Alert for Operators 06004*, which informed aviation operators of the fatigue-related information in the DOT OFM program. According to DOT and industry personnel, the Federal Railroad Administration has tested and applied some of the OFM program tools in the railroad industry.<sup>17</sup>

In addition, the Rail Safety Improvement Act of 2008<sup>18</sup> states that the Secretary of Transportation, by regulation, shall require each railroad carrier that is a Class I railroad,<sup>19</sup> a railroad carrier that has inadequate safety performance (as determined by the Secretary), or a railroad carrier that provides intercity rail passenger or commuter rail passenger transportation to develop and update, at least once every 2 years, a fatigue management plan designed to reduce the fatigue experienced by safety-related railroad employees, as well as the likelihood of accidents, incidents, injuries, and fatalities caused by fatigue. Further, the Airline Safety and FAA Extension Act of 2010<sup>20</sup> will require all Part 121 air carriers to submit to the FAA a fatigue risk management plan for its pilots so that the FAA can review and accept it. The plan must include annual fatigue management training for pilots, a work/rest policy to help manage pilot fatigue, and a methodology to assess the effectiveness of the program. Air carriers will also be required to update and resubmit their plans to the FAA every 2 years.

The FMCSA has not yet applied such guidance or requirements concerning fatigue management programs in the motor carrier industry. However, until the FMCSA issues guidance to operators on the best practices to apply in developing a fatigue management program, other resources are available to help motor carriers create comprehensive companywide policies and processes for reducing fatigue-related accidents. For instance, organizations such as the National Institute for Occupational Safety and Health and the National Highway Traffic Safety Administration (NHTSA) provide updated information and pamphlets related to shift work that could be used as a starting point for developing a fatigue management program.<sup>21</sup> In addition, the

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<sup>15</sup> *Commercial Transportation Operator Fatigue Management Reference* (Washington, DC: U.S. Department of Transportation, Research and Special Programs Administration, 2003).

<sup>16</sup> NTSB/AAR-06/01.

<sup>17</sup> *Validation and Calibration of a Fatigue Assessment Tool for Railroad Work Schedules, Summary Report*, DOT-06/21 (Washington, DC: U.S. Department of Transportation, Federal Railroad Administration, 2006).

<sup>18</sup> For additional information, see [http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110\\_cong\\_bills&docid=f:h2095enr.txt.pdf](http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_cong_bills&docid=f:h2095enr.txt.pdf) (accessed August 12, 2010).

<sup>19</sup> A Class I railroad is one that has annual carrier operating revenues that meet the threshold amount for Class I carriers as determined by the Surface Transportation Board under 49 *Code of Federal Regulations* 1201.1-1.

<sup>20</sup> For additional information, see [http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111\\_cong\\_bills&docid=f:h5900rds.txt.pdf](http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_cong_bills&docid=f:h5900rds.txt.pdf) (accessed August 19, 2010).

<sup>21</sup> For additional information, see <http://www.cdc.gov/niosh/topics/workschedules/> and [http://www.nhtsa.gov/people/injury/drowsy\\_driving1/human/drows\\_driving/resource/resource.html](http://www.nhtsa.gov/people/injury/drowsy_driving1/human/drows_driving/resource/resource.html) (both accessed August 24, 2010).

DOT makes available general fatigue management resources and tools through the efforts of its Human Factors Coordinating Committee.<sup>22</sup>

The goal of a fatigue management program is to mitigate human fatigue, thereby reducing the probability of human-error-caused incidents and accidents. Pilot studies conducted for the NAFMP have shown positive results with respect to driver sleep lengths and reduction in critical driving events.<sup>23</sup> Other modes of transportation—in particular, aviation and rail—have moved toward mandating fatigue management programs for their modal carriers. The NTSB concludes that the use of fatigue management programs by motor carriers has the potential to reduce accidents caused by fatigued commercial drivers. Given that its lack of an effective fatigue management program contributed to an environment that did not sufficiently emphasize the importance of fatigue awareness and countermeasures among its drivers, the NTSB believes that AWG must take action to resolve this deficiency.

As a result of the investigation, the National Transportation Safety Board makes the following recommendation to Associated Wholesale Grocers, Inc.:

Create and implement a comprehensive fatigue management program using existing sources of information, and develop a systematic process to update the program as more guidance becomes available. (H-10-16)

The National Transportation Safety Board also issued safety recommendations to the Federal Motor Carrier Safety Administration and the National Highway Traffic Safety Administration. In response to the recommendation in this letter, please refer to Safety Recommendation H-10-16. If you would like to submit your response electronically rather than in hard copy, you may send it to the following e-mail address: [correspondence@ntsb.gov](mailto:correspondence@ntsb.gov). If your response includes attachments that exceed 5 megabytes, please e-mail us asking for instructions on how to use our secure mailbox. To avoid confusion, please use only one method of submission (that is, do not submit both an electronic copy and a hard copy of the same response letter).

Chairman HERSMAN, Vice Chairman HART, and Members SUMWALT, WEENER, and ROSEKIND concurred in this recommendation.

*[Original Signed]*

By: Deborah A.P. Hersman  
Chairman

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<sup>22</sup> See <<http://hfcc.dot.gov/ofm/index.html>> (accessed August 19, 2010).

<sup>23</sup> (a) A. Moscovitch and others, *Development of a North American Fatigue Management Program for Commercial Motor Carriers: Phase II (Pilot Study)*, TP 14828E (Ottawa, Ontario: Transport Canada, January 2006). (b) A. Smiley and others, *Effects of a Fatigue Management Program on Fatigue in the Commercial Motor Carrier Industry: Summary Report*, TP 14921E (Ottawa, Ontario: Transport Canada, September 2009).