National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: September 2, 2011

In reply refer to: H-11-1

The Honorable Ray LaHood
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

On October 22, 2009, about 10:38 a.m. eastern daylight time, a 2006 Navistar International truck-tractor in combination with a 1994 Mississippi Tank Company MC331 specification cargo tank semitrailer (the combination unit), operated by AmeriGas Propane, L.P., and laden with 9,001 gallons of liquefied petroleum gas, rolled over on a connection ramp after exiting Interstate 69 (I-69) southbound to proceed south on Interstate 465 (I-465), about 10 miles northeast of downtown Indianapolis, Indiana.[1]

The truck driver was negotiating a left curve in the right lane on the connection ramp, which consisted of two southbound lanes, when the combination unit began to encroach upon the left lane, occupied by a 2007 Volvo S40 passenger car. The truck driver responded to the Volvo's presence in the left lane by oversteering clockwise, causing the combination unit to veer to the right and travel onto the paved right shoulder. Moments later, the truck driver steered counterclockwise to redirect and return the combination unit from the right shoulder to the right lane.

The truck driver's excessive, rapid, evasive steering maneuver triggered a sequence of events that caused the cargo tank semitrailer to roll over, decouple from the truck-tractor, penetrate a steel W-beam guardrail, and collide with a bridge footing and concrete pier column supporting the southbound I-465 overpass. The collision entirely displaced the outside bridge pier column from its footing and resulted in a breach at the front of the cargo tank that allowed the liquefied petroleum gas to escape, form a vapor cloud, and ignite. The truck-tractor came to rest on its right side south of the I-465 overpasses, and the decoupled cargo tank semitrailer came to rest on its left side, near the bridge footing supporting the southbound I-465 overpass. The truck driver and the Volvo driver sustained serious injuries in the accident and postaccident fire,

[1] For additional information, see *Rollover of a Truck-Tractor and Cargo Tank Semitrailer Carrying Liquefied Petroleum Gas and Subsequent Fire, Indianapolis, Indiana, October 22, 2009,* Highway Accident Report NTSB/HAR-11/01 (Washington, DC: National Transportation Safety Board, 2011), which is available on the NTSB website at <http://www.ntsb.gov/>.

and three occupants of passenger vehicles traveling on I-465 received minor injuries from the postaccident fire.

The National Transportation Safety Board (NTSB) determined that the probable cause of this accident was the excessive, rapid, evasive steering maneuver that the truck driver executed after the combination unit began to encroach upon the occupied left lane. Contributing to the rollover was the driver's quickly steering the combination unit from the right shoulder to the right lane, the reduced cross slope of the paved right shoulder, and the susceptibility of the combination unit to rollover because of its high center of gravity. Mitigating the severity of the accident was the bridge design, including the elements of continuity and redundancy, which prevented the structure from collapsing.

A basic requirement for evaluating the accident performance of U.S. Department of Transportation (DOT) specification cargo tanks (such as the MC331 involved in this accident) is access to data that can be used to quantify both the involvement of those tanks in reportable incidents and the in-service population of those same tanks. While the approximate number of DOT specification cargo tanks involved in accidents may be obtained from the Hazardous Materials Information System or other databases, there is limited access to accurate information on the population of cargo tanks by DOT specification. For example, the most precise number of petroleum-hauling DOT 406 cargo tank semitrailers cited in the *Cargo Tank Roll Stability Study*[2] appeared to be somewhere between 10,648–60,003 units.

When asked at the August 2010 NTSB public hearing, a Pipeline and Hazardous Materials Safety Administration (PHMSA) official acknowledged that the agency did not know the total number of cargo tanks by DOT specification that were currently in service.[3] Further, PHMSA indicated that data analyses for evaluating the performance of DOT specification cargo tanks could be enhanced if the population of cargo tanks by DOT specification were available. The NTSB concludes that the absence of a requirement for motor carriers to periodically provide the number of cargo tanks by DOT specification limits the ability to perform accurate trend analyses.

The limited information currently available for PHMSA to quantify the distribution of cargo tanks by DOT specification differs considerably, for example, from information that can be accessed by the Association of American Railroads (AAR) about tank cars used for transporting bulk liquids by rail. The AAR has used the Universal Machine Language Equipment Register (UMLER) equipment management information system as the industry's central repository for registered railroad and intermodal equipment since 1968. The UMLER system is updated in real time and capable of tracking equipment status, ownership, and inspection history and providing the particular fleet profile.

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[2] D.B. Pape and others, Battelle, *Cargo Tank Roll Stability Study*, final report, contract no. GS23-F-0011L (Washington, DC: U.S. Department of Transportation, Federal Motor Carrier Safety Administration, April 30, 2007).

[3] Testimony delivered by Charles H. Hochman, Director, Office of Hazardous Materials Technology, August 4, 2010, at NTSB public hearing concerning the Indianapolis rollover accident.

The population of cargo tanks by DOT specification could be obtained by modifying the *Hazardous Materials Registration Statement* (DOT Form F 5800.2), administered by PHMSA, or the *Motor Carrier Identification Report* (MCS-150), administered by the Federal Motor Carrier Safety Administration (FMCSA). Although the MCS-150 requires carriers to report the classes of hazardous materials transported and the number of cargo tank single-unit trucks and trailers that are owned and leased, no obligation exists to provide the DOT specification, age, or carrying capacity of cargo tanks. Consequently, arrangements could be made to revise the MCS-150 form to regularly require all intrastate and interstate hazardous materials carriers to provide basic information about a cargo tank motor vehicle's manufacture date, carrying capacity, DOT specification, and other pertinent information for conducting risk assessments.

Therefore, as a result of the investigation, the National Transportation Safety Board makes the following recommendation to the U.S. Department of Transportation:

> Require all intrastate and interstate hazardous materials carriers to submit annually the number and types of U.S. Department of Transportation specification cargo tanks that are owned or leased in addition to data displayed on the specification plates of such tanks and, if necessary, modify the appropriate database to accept additional data fields. (H-11-1)

The NTSB also issued safety recommendations to the FMCSA, PHMSA, the National Highway Traffic Safety Administration (NHTSA), the Federal Highway Administration, and the American Association of State Highway and Transportation Officials (AASHTO). Additionally, this report reclassifies previously issued recommendations to NHTSA and AASHTO.

In response to the recommendation in this letter, please refer to Safety Recommendation H-11-1. 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. 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, ROSEKIND, and WEENER concurred in the issuance of this recommendation.

Original Signed By

By: Deborah A.P. Hersman
Chairman