

driver of a passenger vehicle died after his westbound vehicle struck a northbound cargo tank motor vehicle broadside and the product piping sheared off the cargo tank and released 38 gallons of gasoline. A fire broke out. The driver was trapped inside the vehicle wedged under the cargo tank and died in the automobile.

*Yonkers, NY (one fatality).* On October 9, 1997, in Yonkers, New York, a passenger vehicle struck a cargo tank motor vehicle in the area of the external loading and unloading lines, fracturing the cargo tank's product piping and releasing approximately 28 gallons of gasoline. After surviving the initial impact of the collision, the 62-year old driver of the passenger vehicle died from burns and smoke inhalation from the fire that ignited immediately.

*Hammond, IN (two fatalities).* On November 12, 1999, in Hammond, Indiana, the 21-year old driver of a passenger vehicle and a four-year old passenger died from burns sustained in a fire that ignited immediately following the collision of their vehicle with a cargo tank motor vehicle. The passenger vehicle struck the cargo tank in the area of the piping manifold releasing the gasoline contained in the product piping. Both vehicles were destroyed by the fire that subsequently spread from the product piping and consumed the entire contents of the cargo tank.

*Detroit, MI (one fatality).* On July 11, 2001, near Detroit, Michigan, an out of control automobile crashed into a highway barrier and then collided with the underside of a cargo tank motor vehicle. The trapped automobile driver died as a result of the ignition of approximately 50 gallons of gasoline.

### III. Alternatives for Addressing Safety Risk

In 1994, the American Petroleum Institute (API) initiated a two-phased study to assess the risks posed by petroleum products in unprotected product piping. Phase I of the study, titled *Alternative Means of Loading Cargo Tank Motor Vehicles*, analyzed the risks posed by the existing industry practice. This phase was completed in February 1994 and concluded:

There is a small but definable risk to the public from a wet line spill. \* \* \* the consequences can be more severe for the occupants of an automobile that impacts and fractures the wet lines and ignites the wet line contents. The majority of reported wet line spills are under 20 gallons. For this spill size of 20 gallons, the calculated maximum injury radius is 36 feet.

Phase II of the study was to identify engineering designs that would have the potential for eliminating wetlines or

provide collision protection to reduce or eliminate the risk. Because Phase I of the study concluded that the probability of a fatality being directly attributed to wetlines is "quite low," the second phase of the study was not considered. In its Executive Summary API stated, "Based on the information gathered, the fatality rate from wetline spills is one for every  $1.8 \times 10^{10}$  miles traveled, or one fatality every eleven years." It also noted that additional information indicated the fatality rate could be considerably higher. In fact, this information indicated that "the fatality rate for these conditions is one for every  $1.1 \times 10^9$  miles" traveled, or 0.7 fatalities per year.

We are aware of two systems that have been demonstrated to reduce risks from wetlines. The first is an onboard system that evacuates the wetlines by forcing the lading out of the product piping and into the cargo tank body. After loading is complete and the main cargo compartment valves are closed, the system introduces compressed air from an auxiliary tank into the product piping under low pressure and at a low flow rate. Lading in the product piping flows through separate purging lines into the cargo tank body. This purging process is controlled automatically and lasts approximately six minutes. The system is also capable of detecting and automatically purging any leakage of product through the cargo tank's internal shutoff valve into the product piping, thereby eliminating a potential wetline condition during transportation. For an average cargo tank motor vehicle, the weight increase for a manual purging system is approximately 48 pounds.

The second system involves adding a set of short lines for loading that are independent of the unloading lines. These short loading lines, placed on the lower part of the cargo tank, are accessible and are not exposed to damage in case of rollover. Each short four-inch inside diameter pipe extends from the cargo tank wall and contains approximately one gallon of hazardous material; depending on the number of compartments on the cargo tank motor vehicle, the short line piping system on the vehicle could contain 4–5 gallons of hazardous material rather than the 30 to 50 gallons contained in a typical product piping system. For an average cargo tank motor vehicle, the weight increase for the short external product piping option is approximately 50 pounds.

For a system using separate loading lines, it may be feasible to recess the loading connections into the interior cargo tank body so that the surface of

the loading inlet is flush with the cargo tank wall. This option may be preferred by cargo tank manufacturers and owners because it eliminates the need to ensure that external product piping is designed and positioned so as to protect the integrity of the cargo tank wall in the event of an accident. Recessing of loading inlets within the cargo tank wall would be expected to eliminate the risks posed by external product piping and could be designed to meet the appropriate accident damage protection requirements. At the present time, however, this option may be unrealistic because substantial modifications to existing loading racks would be necessary or loading times would increase due to the cargo tank being moved to reach loading arms. In addition, there are questions about the effectiveness of such a design and whether it might adversely impact the structural integrity of the cargo tank.

We understand that one major oil company, representing less than one percent of the potentially affected cargo tank population, has chosen to outfit its fleet with a system that purges product from unprotected external piping. Two additional carriers installed the same purging system on a small portion of their fleets as part of a successful field evaluation and expressed interest in equipping their entire fleets. However, these carriers have chosen to defer installation pending possible RSPA rulemaking.

There may also be other ways to reduce wetlines risk. For example, many of the incidents of which we are aware appear to be caused because automobile drivers do not see the cargo tank motor vehicle. Perhaps marking or other systems that increase vehicle conspicuity could be effective in reducing collisions between cargo tank motor vehicles and automobiles.

Further, we are aware that at least one cargo tank operator has installed under-ride protection on its cargo tank motor vehicles. Although this protection may not meet the bottom damage protection requirements under § 178.345–8(b), we invite comments on whether this may or may not substantially reduce the risks posed by unprotected product piping.

### IV. Costs and Benefits of Risk Reduction Measures

It is our understanding that the useful life of a cargo tank motor vehicle is at least 20 years. However, we are aware that many cargo tank motor vehicles may remain in service for up to 30 years. Based on information in the U.S. Census Bureau's 1997 *Vehicle Inventory and Use Survey (VIUS)*, it appears that the average annual population of cargo