

Concrete Mixer Rollover Accident Failure Analysis:

On May 12, 2008, a forward-discharge concrete mixer truck manufactured in 2007 impacted the rear of a 2008 Honda Accord sedan that was merging onto the freeway near Charleston, South Carolina. The two vehicles veered to the right of the interstate, and the concrete mixer truck overturned. The mixer's drum assembly landed on the roof of the passenger car, severely damaging it. The driver of the concrete truck walked away with minor injuries. The driver and two passengers of the Honda survived the initial collision and the roof crush. Despite the diligent and immediate efforts of volunteers responding to the accident, two of the three occupants of the Honda died due to mechanical asphyxiation as concrete slowly discharged into the interior of the vehicle.

Analysis reveals that this accident was not unexpected. Concrete mixers overturn at a greater rate than do any other common vehicle type. This is because they combine a high center of gravity vehicle with a "live load"; the center of gravity of the concrete changes during mixing as the vehicle is moving. According to self-reported data, the rate of overturn of these vehicles is on the order of two percent of the fleet annually. The *ConcreteWorks 2010* conference brochure listed a "Rollover" session that was "back by popular demand." The brochure indicated that their estimate is that two percent of the entire fleet overturns annually. I provided analysis of the overall safety of the cement mixer with respect to the technological state of the art.

