

STATE FIRE MARSHAL'S OFFICE

Firefighter Fatality Investigation



Investigation Number 06-139-11

Firefighter Clint Dewayne Rice

Carlton Volunteer Fire Department

November 22, 2005

Texas Department of Insurance
Austin, Texas

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Summary

Firefighter Clint Dewayne Rice, age 28, died in a motor vehicle incident while driving a tractor-trailer water tender to a wildfire in Hamilton County on November 22, 2005. Firefighter Rice was a member of the Carlton Volunteer Fire Department (CVFD).

CVFD was providing mutual aid to the Hamilton, Texas fire department in fighting a large grass fire. Firefighter Rice lost control of his vehicle while rounding a turn on Farm-to-Market Road 219, causing the truck to overturn. Rice was ejected from the truck cab and was pronounced dead at the scene. He was not wearing a seat belt.

Firefighter Rice served in the Carlton Volunteer Fire Department for three months. He is survived by his wife.

Introduction

The Texas State Fire Marshal's Office was notified of the death of Carlton Firefighter Clint Rice on November 24, 2005. State Fire Marshal's Office (SFMO) Director of Inspections Richard L. Bishop was assigned as the SFMO fatality investigation team leader. Bishop traveled to the scene of the incident in Hamilton County on November 29, 2005 to conduct an investigation of the incident.

The SFMO commenced a firefighter fatality investigation under the authority of Texas Government Code Section 417.0075. The statute requires SFMO to investigate the circumstances surrounding the death of the firefighter, including the cause and origin of the fire, the condition of the structure, and the suppression operation, to determine the factors that may have contributed to the death of the firefighter. The State Fire Marshal is required to coordinate the investigative efforts of local government officials and may enlist established fire service organizations and private entities to assist in the investigation.

The National Fallen Firefighter's Foundation and the National Institute for Occupational Safety and Health (NIOSH) Fire Fighter Fatality Investigation and Prevention Program were notified.

Origin and Cause Investigation

The Hamilton County Sheriff's Office determined that the cause of the wildfire was accidental.

Building Structure and Systems

No structures were reported involved in the wildfire.

Investigation of the Death of the Firefighter

On November 22, 2005 at approximately 2:10 PM, the Hamilton County Sheriff's Office notified the Carlton Volunteer Fire Department (CVFD) that the Hamilton Fire Department had requested assistance with a large wildfire six miles west of Hamilton on Highway 36.

Unit 612, a modified military 6-wheel drive brush truck, driven by Firefighter James Rice, departed the CVFD station enroute to the fire. Firefighter Clint Rice departed shortly thereafter in Unit 610, a 1979 Freightliner cabover tractor-trailer water tender. CVFD purchased the Freightliner tractor of Unit 610 in 1996. The tank trailer of Unit 610 was a 1968 Heil 5000-gallon fuel tanker obtained from the Federal Excess Personal Property (FEPP) program administered by the Texas Forest Service. CVFD converted the former M131A5 military fuel tank trailer to a water tender, modified the tank compartment dividers into baffles, and installed additional equipment including a water pump, hose, and fittings.

Approximately 2.5 miles from the CVFD station on Farm-to-Market Road 219, Unit 610 passed a diamond left curve sign with a 40 mph speed



FM 219 approaching the incident scene in the direction of travel of Unit 610.

advisory sign attached.

Warning chevrons delineated the curve. The asphalt roadway was dry, in good condition, and had a slight downhill grade continuing into a banked left curve. The incident occurred during daylight hours.

The right side tires of Unit 610 left the roadway at the transition of the straight road into the curve, .17 miles after passing the curve warning sign. Tire marks indicated that Firefighter Rice attempted to steer Unit 610 around the curve.



As Unit 610 approached the apex of the curve, the slope of the shoulder, combined with lateral movement of water in the cargo tank, began to lift the left side tires of the cargo tank off the pavement.

The weight transfer and body lean caused the cargo tank to roll onto its right side, pulling the truck tractor in turn onto its right side. The cargo tank slid down the shoulder and rolled onto its top. This continuing

rollover pulled the truck tractor onto its top. The passenger side door of the truck tractor tore away from the truck cab during the rollover. The rollover continued with the cargo tank rolling onto its left side, pulling the truck tractor over onto its left side, tearing away the driver's door.

During the rollover, the truck cab roof was sheared away just above the dashboard. Firefighter Rice, who was not wearing the driver's seat safety belt, was ejected from the truck cab and landed on the right hand lane of the roadway, approximately 30 feet from the final resting point of the truck cab.



**Final resting position of tractor-trailer.
Photo by Hamilton County JP Lively .**

As the tractor-trailer combination came to rest in a field, the truck tractor rolled back upright onto its wheels. The cargo tank

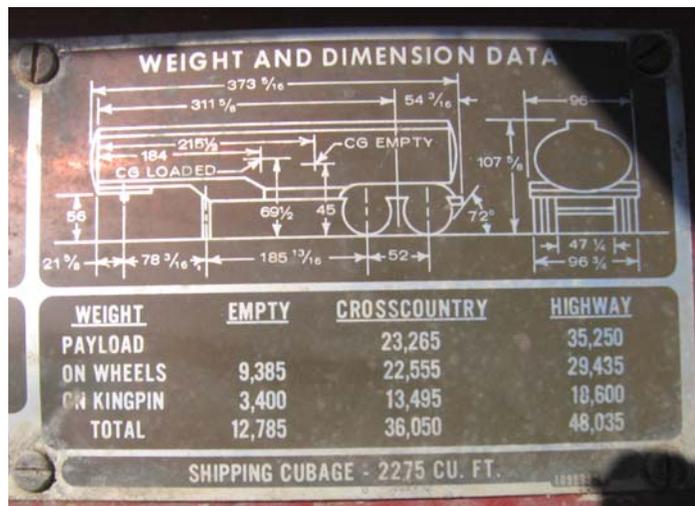
came to rest on its left side. The force of the rollover separated several tire/axle assemblies from the tractor-trailer water tender. The vehicle traveled approximately 330 feet from the point the first tire left the roadway.

Texas Department of Public Safety trooper Steven Schwartz investigated the motor vehicle incident and cited “unsafe speed (below legal limit), defective or slick tires, and defective or no trailer brakes” as contributing factors on his official report. Trooper Schwartz checked the air pressure in the undamaged tires of Unit 610 and his report states that air pressure in those tires ranged from 30 to 88 psi. This mix of tire pressures may have adversely affected the handling of the tractor-trailer water tender.

The military technical and maintenance manual for the M135A5 fuel tank trailer <http://www.tpub.com/content/semis/TM-9-2330-272-14P/index.htm> states hard surface road tire pressure should be 60 psi based on a 48,035 pound gross trailer weight. This gross trailer weight was based on a 5,000 gallon cargo of fuel weighing 35,250 pounds. Filling this trailer with 5,000 gallons of water weighing 41,700 pounds, (8.34 pounds/gallon) produces a gross trailer weight of 54,485 pounds.

This is 6,450 pounds over the maximum 48,035-pound gross weight listed on the information placard on the trailer frame. This does not take into account the weight of the water pump and any additional equipment installed by CVFD.

Exceeding the gross trailer weight may have an adverse effect on vehicle handling, braking, and performance and may violate state motor vehicle laws.



Military data plate on frame of tank trailer

The tank trailer originally had two compartments divided by bulkheads. SFMO investigators found that CVFD modified these bulkheads by cutting large holes in them to facilitate the transfer and discharge of water. While these modified bulkheads may have served as baffles to control the movement of water from front to back in the cargo tank, there were no baffles to control the lateral movement of water, which would tend to affect the handling characteristics of the vehicle as the weight of the water shifted from side-to-side.

Training of Vehicle Operators

Firefighter Rice served on the CVFD approximately three months prior to this incident. CVFD Chief Bill Hollingsworth stated Firefighter Rice had been discharged from the US

Air Force where he operated flight line refueling tankers. Firefighter Rice was a heavy-duty truck mechanic by trade, and had a Class C Texas driver's license. Prior to this incident, Firefighter Rice had not driven Unit 610 to a fire. Chief Hollingsworth stated that CVFD firefighters attend regional training courses, but there was no formal departmental driver training program. Firefighter Rice did not hold any certifications as a firefighter from the State Firemen's and Fire Marshals' Association of Texas or the Texas Commission on Fire Protection.

Personal Protective Equipment and Injury Evaluation

Firefighter Rice was not wearing any firefighter protective equipment at the time of the motor vehicle incident.

The driver's seat of the 1979 Freightliner cabover truck-tractor-owned by Carlton VFD is equipped with a lap type safety belt, but Firefighter Rice was not wearing it at the time of the motor vehicle incident. Due to the forces involved in this crash, it is not possible to determine if safety belt use would have prevented fatal injuries to Firefighter Rice.



Left side view of truck cab of Unit 610

Cause of Death

Passersby found firefighter Rice lying in the roadway approximately 30 feet from where the truck-tractor came to rest after leaving the roadway and rolling over. There were no eyewitnesses to the motor vehicle incident.

Firefighter Rice had sustained catastrophic head injuries, was not breathing, and did not have a detectable pulse.

Hamilton County Precinct 1 Justice of the Peace James Lively pronounced Firefighter Rice dead at the scene of the incident at 3:35 PM. Judge Lively attributed the cause of death to an open skull fracture, but did not order an autopsy.

Findings & Recommendations

The following recommendations are based upon nationally recognized consensus standards for the fire service. All fire departments should be aware of the content of the standards and should develop programs based on them to increase the level of safety for fire department personnel.

Finding #1 – Carlton Volunteer Fire Department Unit 610, driven by Firefighter Clint Rice, entered a marked curve at an unsafe speed. Firefighter Rice was unable to maintain control of the vehicle, causing it to leave the roadway and overturn.

Contributing factors:

- The fully loaded cargo tank trailer exceeded the maximum gross weight listed on the data plate by at least 6,450 pounds.
- The existing baffles in the cargo tank were inadequate to control water movement and subsequent weight shifts.
- The tires on the tractor-trailer combination had inconsistent inflation pressures, some of which were dangerously low.
- The Texas Department of Public Safety report cited “defective or no trailer brakes.”

The overloaded vehicle, combined with unsafe and inconsistent tire pressures and inadequate water tank baffles presented an extreme challenge to the driver to maintain control, even at low speeds.

Recommendation: All fire departments should consider safety and health as primary concerns in the specification, design, construction, acquisition, operation, maintenance, inspection, and repair of all fire department apparatus. Fire departments should utilize the resources discussed in this report to evaluate their water tender (tanker) policies.

Texas Transportation Code § 545.351 (Reasonable and Prudent Speed requirement) NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, Chapter 6.1.1, Quincy, MA: National Fire Protection Association.

Finding #2 – The Carlton Volunteer Fire Department did not implement measures to prevent the Federal Excess Personal Property (FEPP) program tank vehicle from being loaded over the maximum permissible gross weight when it was converted to firefighting use.

Recommendation: Any fire department acquiring a vehicle, chassis, or trailer not originally designed as firefighting apparatus should proceed with caution when converting equipment for use in firefighting. Fire departments should take into account factors such as the weight of tank water and equipment, center of gravity, load distribution, capacity of the drivetrain, tires, steering, and braking systems during fire apparatus construction.

Recommendation: All fire departments acquiring vehicles, chassis, or trailers should refer to all available manuals or documentation prior to commencing conversion or modification operations. Water tanks should be clearly marked with the tank capacity and full gross weight. Fire departments should install positive physical safeguards, such as overflow vents, to prevent vehicles from exceeding maximum permissible gross weight when fully loaded.

Texas Transportation Code § 622.952 Fire Department Vehicle (maximum weight may not exceed manufacturer's gross vehicle weight capacity); USFA/FEMA [2003]. Safe operation of fire tankers. Emmitsburg, MD: U.S. Fire Administration, Publication No. FA 248; NIOSH [2001]. NIOSH Hazard ID: Fire Fighter Deaths from Tanker Truck Rollovers. Cincinnati, OH:U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 2002-111.

Finding #3 – The Carlton Volunteer Fire Department did not have an apparatus driver education and qualification program in its standard operating procedures manual at the time of the incident.

This was the first time CVFD Firefighter Clint Rice had driven this tractor-trailer water tender to a fire. The departmental SOP manual contains minimal information regarding safe operation of fire department vehicles.

Recommendation: All fire departments and fire officers should review departmental driver policies and ensure all drivers receive periodic training and skills testing. Drivers of specialized vehicles should receive additional training in the unique handling, operations, and performance characteristics of these vehicles.

Fire apparatus should be operated only by members who have successfully completed an approved driver training program or by trainee drivers who are under the supervision of a qualified driver. Drivers of fire apparatus should have valid driver's licenses. Vehicles should be operated in compliance with all traffic laws, including sections pertaining to emergency vehicles. Drivers of fire apparatus should be directly responsible for the safe and prudent operation of the vehicles under all conditions. When the driver is under the direct supervision of an officer, that officer should also assume responsibility for the driver's actions. Drivers should not move fire

apparatus until all persons on the vehicle are seated and secured with seat belts in approved riding positions.

Resources for driver training include the Texas Engineering Extension Service Emergency Services Training Institute (TEEX-ESTI) <http://teexweb.tamu.edu/esti/> or VFIS Insurance's Emergency Services Education and Consulting Group http://www.vfis.com/esecg_train/train_main.htm

NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, Chapters 6.2, 8.3, 8.4, Quincy, MA: National Fire Protection Association

Finding #4 – The Carlton Volunteer Fire Department did not maintain the tire pressures in water tender Unit 610 in a consistent, safe, and legal manner.

Multiple tires on both the truck-tractor and trailer varied significantly in inflation pressure, which could have affected the handling characteristics of the vehicle

Recommendation: All fire departments should institute inspection and maintenance programs in which fire apparatus should be inspected at least weekly, within 24 hours after any use or repair, and prior to being placed in service or used for emergency purposes to identify and correct unsafe conditions. A preventive maintenance program should be established, and records should be maintained. NFPA 1915, *Standard for Fire Apparatus Preventive Maintenance Program*, provides information regarding inspection, maintenance, and repair of fire apparatus. The fire department should establish a list of major defects to be utilized to evaluate when a vehicle should be declared unsafe. Any fire department vehicle found to be unsafe should be placed out of service until repaired.

Texas Transportation Code § 547.004 (Operation of Unsafe Vehicle); NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, Chapter 6.4, Quincy, MA: National Fire Protection Association

