

Highway Accident Report

Collision Between Amtrak Train 97 and Molnar Worldwide Heavy Haul Company Tractor-Trailer Combination Vehicle at Highway-Rail Grade Crossing in Intercession City, Florida, on November 17, 2000



**National
Transportation
Safety Board**
Washington, D.C.

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**National Transportation Safety Board
490 L'Enfant Plaza, S.W.
Washington, D.C. 20594**

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Abstract: On November 17, 2000, near Intercession City, Florida, a heavy-haul vehicle, operated by Molnar Worldwide Heavy Haul Company, was delivering a condenser to the Kissimmee Utility Authority Cane Island Power Plant. The private access road to the plant crossed over a single railroad track owned by CSX Transportation, Inc. As the vehicle crossed the tracks, the crossing warning devices activated and the gates came down on the load. Seconds later, Amtrak train 97 collided with the right side of the rear towed tractor. No injuries occurred. The collision destroyed the tractor and caused over \$200,000 damage to the train and crossing signals.

The following safety issues are discussed in this report.

- The ineffective execution of the roles and responsibilities of the power company and its contractors and subcontractors, the Florida Department of Transportation, the motor carrier, the truckdriver, and pilot car drivers in planning and effecting the movement of this oversize load;
- The adequacy of the railroad notification requirement;
- The consistency and availability of information regarding railroad notification; and
- The lack of low-clearance warning signs and standard 1-800 emergency number signs.

As a result of this accident investigation, the National Transportation Safety Board issued recommendations to the Federal Highway Administration, the Federal Motor Carrier Safety Administration, the American Association of State Highway and Transportation Officials, the National Committee on Uniform Traffic Laws & Ordinances, the Kissimmee Utility Authority, and all class 1 and regional railroads.

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Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ASLRRA	American Short Line and Regional Railroad Association
BNSF	Burlington Northern Santa Fe
CDL	commercial driver's license
CFR	<i>Code of Federal Regulations</i>
CP	Canadian Pacific
CSXT	CSX Transportation, Inc.
FHWA	Federal Highway Administration
FLDOT	Florida Department of Transportation
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FSS	Florida State Statute
Hz	hertz
KCS	Kansas City Southern
KUA	Kissimmee Utility Authority
Molnar	Molnar Worldwide Heavy Haul Company
MUTCD	Manual on Uniform Traffic Control Devices
NCUTLO	National Committee on Uniform Traffic Laws & Ordinances
NS	Norfolk Southern
NYDOT	New York Department of Transportation
OLI	Operation Lifesaver, Inc.
psi	pounds per square inch
SC&RA	Specialized Carriers & Rigging Association
TEi	Thermal Engineering International
UP	Union Pacific

Executive Summary

On November 17, 2000, about 4:35 p.m., eastern standard time, near Intercession City, Florida, a 23-axle, heavy-haul vehicle, operated by Molnar Worldwide Heavy Haul Company, was delivering a condenser to the Kissimmee Utility Authority Cane Island Power Plant. The private access road to the plant crossed over a single railroad track owned by CSX Transportation, Inc. As the vehicle, traveling between 1 and 3 mph, crossed the tracks, the crossing warning devices activated and the gates came down on the load. Seconds later, Amtrak train 97, operated by the National Railroad Passenger Corporation, collided with the right side of the rear towed four-axle tractor. No injuries occurred. The collision destroyed the tractor and caused over \$200,000 damage to the train and crossing signals.

The National Transportation Safety Board investigated a similar accident that occurred on November 30, 1993, at the same location (Highway Accident Report NTSB/HAR-95/01). In that accident, an overdimension, low-clearance vehicle operated by Rountree Transport and Rigging, Inc., was en route to deliver an 82-ton turbine to the electricity generating plant. The cargo deck of the transporter bottomed out on the roadway surface as the vehicle moved across the tracks. To gain sufficient clearance, the four-member truck crew shimmed the transporter while the cargo deck was on the tracks. About 12:40 p.m., the lights and bells at the grade crossing activated; the crossing gates descended, striking the turbine. Seconds later, Amtrak train 88, carrying 10 crewmembers and 89 passengers, struck the side of the cargo deck and the turbine. Six people sustained serious injuries and 53 suffered minor injuries. The vehicle and turbine were destroyed; the locomotive and first three railcars were damaged extensively. Total damage exceeded \$14 million.

The National Transportation Safety Board determines that the probable cause of the November 2000 collision of Amtrak train 97 with the tractor-combination vehicle was the failure of the Kissimmee Utility Authority, its construction contractors and subcontractors, and the motor carrier to provide for the safe passage of the load over the grade crossing.

The following safety issues were identified in this accident.

- The ineffective execution of the roles and responsibilities of the power company and its contractors and subcontractors, the Florida Department of Transportation, the motor carrier, the truckdriver, and pilot car drivers in planning and effecting the movement of this oversize load;
- The adequacy of the railroad notification requirement;
- The consistency and availability of information regarding railroad notification; and

- The lack of low-clearance warning signs and standard 1-800 emergency number signs.

As a result of this accident investigation, the National Transportation Safety Board makes recommendations to the Federal Highway Administration, the Federal Motor Carrier Safety Administration, the American Association of State Highway and Transportation Officials, the National Committee on Uniform Traffic Laws & Ordinances, the Kissimmee Utility Authority, and all class 1 and regional railroads.

Factual Information

Accident Narrative

On November 17, 2000, about 4:35 p.m., eastern standard time, near Intercession City, Florida, a 23-axle, heavy-haul vehicle, operated by Molnar Worldwide Heavy Haul Company (Molnar), was delivering an 82-ton condenser to the Kissimmee Utility Authority (KUA) Cane Island Power Plant. The private access road to the electricity-generating facility crossed over a single railroad track owned by CSX Transportation, Inc. (CSXT).¹ As the vehicle, traveling between 1 and 3 mph, crossed the tracks, the crossing warning devices activated and the gates came down on the load. Seconds later, Amtrak train 97, operated by the National Railroad Passenger Corporation, collided with the right side of the rear towed four-axle tractor. Amtrak train 97 was traveling approximately 57 mph at the time of the collision. Two train crewmembers and three passengers were taken to area hospitals for observation; no injuries occurred. The collision destroyed the tractor and caused over \$200,000 damage to the train and crossing signals.

The tractor-combination vehicle and load (see figures 1 and 2) measured 225 feet long, 15 feet 11 inches wide, and 13 feet 6 inches high; ground clearance was 8 inches; and gross vehicle weight was 380,420 pounds.² The load, valued at \$330,000, was being transported from Salt Lake City, Utah, to the KUA power plant. The truckdriver possessed specialized moving permits for the load that required escort vehicles (pilot cars). At the time of the accident, three private pilot cars were escorting the load. Additionally, KUA representatives were present at the site for the delivery of the condenser. The Amtrak train was bound from New York City to Miami, Florida, with 83 passengers and 4 crewmembers on board.

¹ "CSXT" is a recognized abbreviation for CSX Transportation, Inc., which is a division of CSX Corporation.

² A typical tractor-semitrailer is made up of a tractor (18 to 20 feet long) and a semitrailer (40 to 53 feet long), both 8 feet 6 inches wide and 13 feet 6 inches to 14 feet high, which together weigh a maximum of 80,000 pounds.

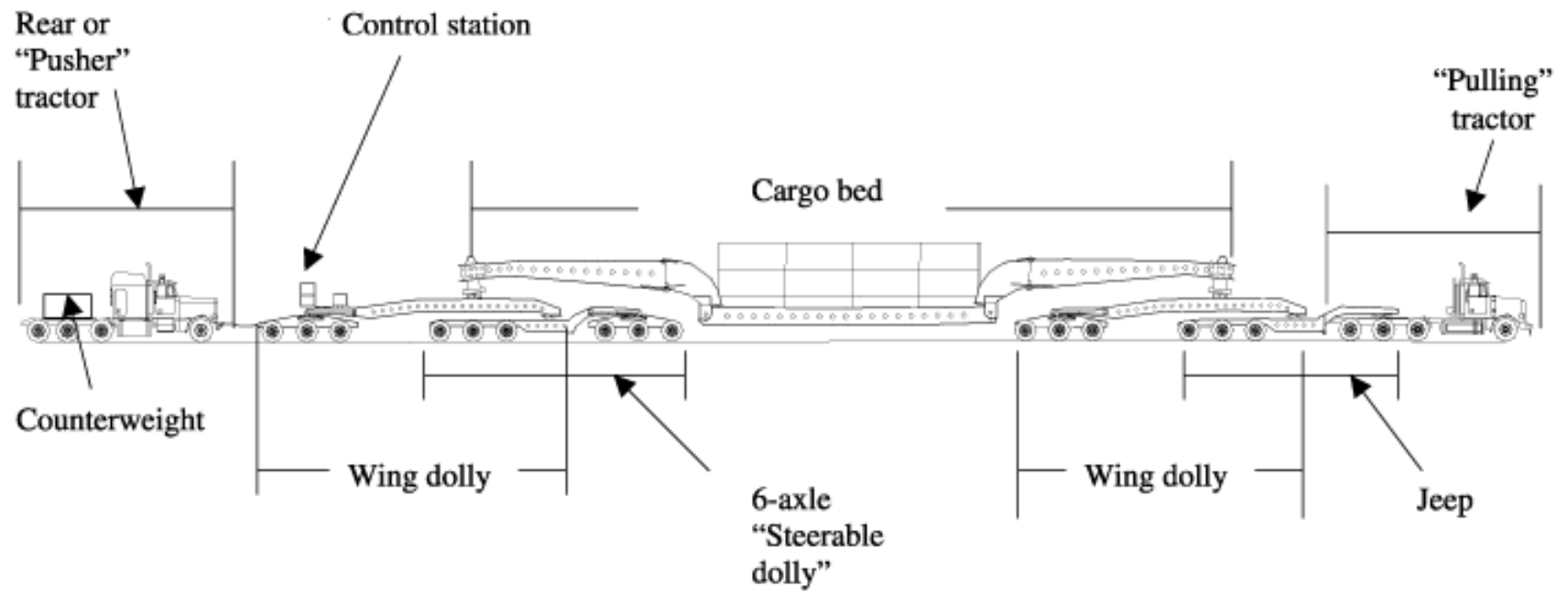


Figure 1. Diagram of accident vehicle.



Figure 2. Photograph of tractor-trailer combination vehicle and load.

Truck Events Preceding the Accident

The transportation of this oversize/overweight load covered over 2,800 miles through 10 States (see figure 3) and had been under way for 28 days at the time of the accident.³ Employees of the manufacturer, Mark Steel Company, loaded the generator onto the Molnar semitrailers, and the accident driver secured the generator onto the vehicles. On October 20, 2000, the truck left Salt Lake City accompanied by two company pilot cars. The convoy crew comprised the truckdriver, an auxiliary operator who steered the rear of the vehicle when necessary, and the two pilot car drivers.

According to the truckdriver, the trip was uneventful until November 9, 2000, when the 1998 Mack tractor being driven had a transmission failure in Mister City, Mississippi.⁴ The tractor was towed to a repair shop in Memphis, Tennessee. According to the driver's hours-of-duty service status (logbook), he stayed in Memphis for 3 1/2 days and then returned with a pilot car driver to the Molnar headquarters in Athens, Texas, to get another tractor. On November 12, 2000, he drove the replacement tractor, a 2001 Peterbilt model, to Mississippi. On November 13, 2000, the truckdriver "hooked up" the tractor to the semitrailers and resumed the trip.

³ Safety Board investigators reconstructed the route using the permits issued by the 10 States and the driver's hours-of-duty status (log books).

⁴ A truck stop just over the Arkansas border.



Figure 3. Map indicating convoy route through States.

During the remainder of the trip, the combination vehicle was involved in two traffic collisions. On November 13, 2000, in Webster County, Mississippi, the truck struck the left side of a passenger vehicle that was stopped on the opposite side of the road to allow the truck to pass. On November 17, 2000, in Wildwood, Florida, a passenger vehicle was attempting to pass the combination vehicle, tried to move back into the lane behind it, and struck the left side of the semitrailer. According to the truckdriver, the combination vehicle was traveling about 4 mph at the time.

The truckdriver estimated that the combination vehicle crossed approximately 15 highway-rail grade crossings, including 3 in Florida, during the trip. The truckdriver also indicated that he did not notify the railroad before traversing these crossings and was not aware that it was a requirement in any of the States through which he had traveled. Of the three crossings in Florida, two on U.S. 27 were protected by active warning devices, including lights, gates, and bells: one in Archer (DOT/AAR # 622512K)⁵ and the other in Williston (DOT/AAR # 622535S). The third crossing was a passive crossing⁶ on State Route 44 in Wildwood (DOT/AAR # 625319J). (See figure 4.) He added that if he had to stop to raise the modular-trailer before traversing a crossing, he could cross at a speed between 1 and 3 mph; if the crossing was “smooth,”⁷ he could cross at 30 mph. The truckdriver indicated that the normal operating speed of the accident vehicle exceeded 10 mph.

⁵ The Federal Railroad Administration and the American Association of Railroads maintain a highway-rail grade crossing inventory. The crossings are numbered.

⁶ A passive crossing is equipped with a railroad “crossbucks” sign (R15-1 in the *Uniform Manual on Traffic Control Devices*).



Figure 4. Map indicating highway-rail grade crossing locations traversed by combination vehicle.

Just before the accident, the convoy (combination vehicle and three private pilot cars) was traveling eastbound on Old Tampa Highway and made a left turn onto the private roadway leading up to the KUA Cane Island Power Park. (See figure 5.) The truckdriver stated that to maneuver the vehicle over the highway-rail grade crossing, he stopped and adjusted the vehicle's cargo deck to its highest position (32-inch ground clearance from a normal 8-inch ground clearance). The truckdriver also stated that because of the combination vehicle's extensive length, the convoy spent a "considerable amount of time" in the intersection attempting to make the left turn. The unique configuration and length of the combination vehicle required an auxiliary operator who was responsible for steering the combination vehicle's rear. (A control station located at the trailer's rear [see figure 1] enabled the auxiliary operator to steer and to regulate the load's height.) The convoy stopped to avoid a guide wire for a utility pole in the southwest corner. The truckdriver had to back up and move forward while the auxiliary driver steered the trailer around the guide wire. Crewmembers also removed a stop sign located at the northwest corner of the intersection. (See figure 6.) Once the trailer was properly aligned, the truckdriver proceeded to cross the tracks without stopping.

⁷ A Safety Board investigator drove the Florida permitted route and estimated that the three grade crossings were on level ground.

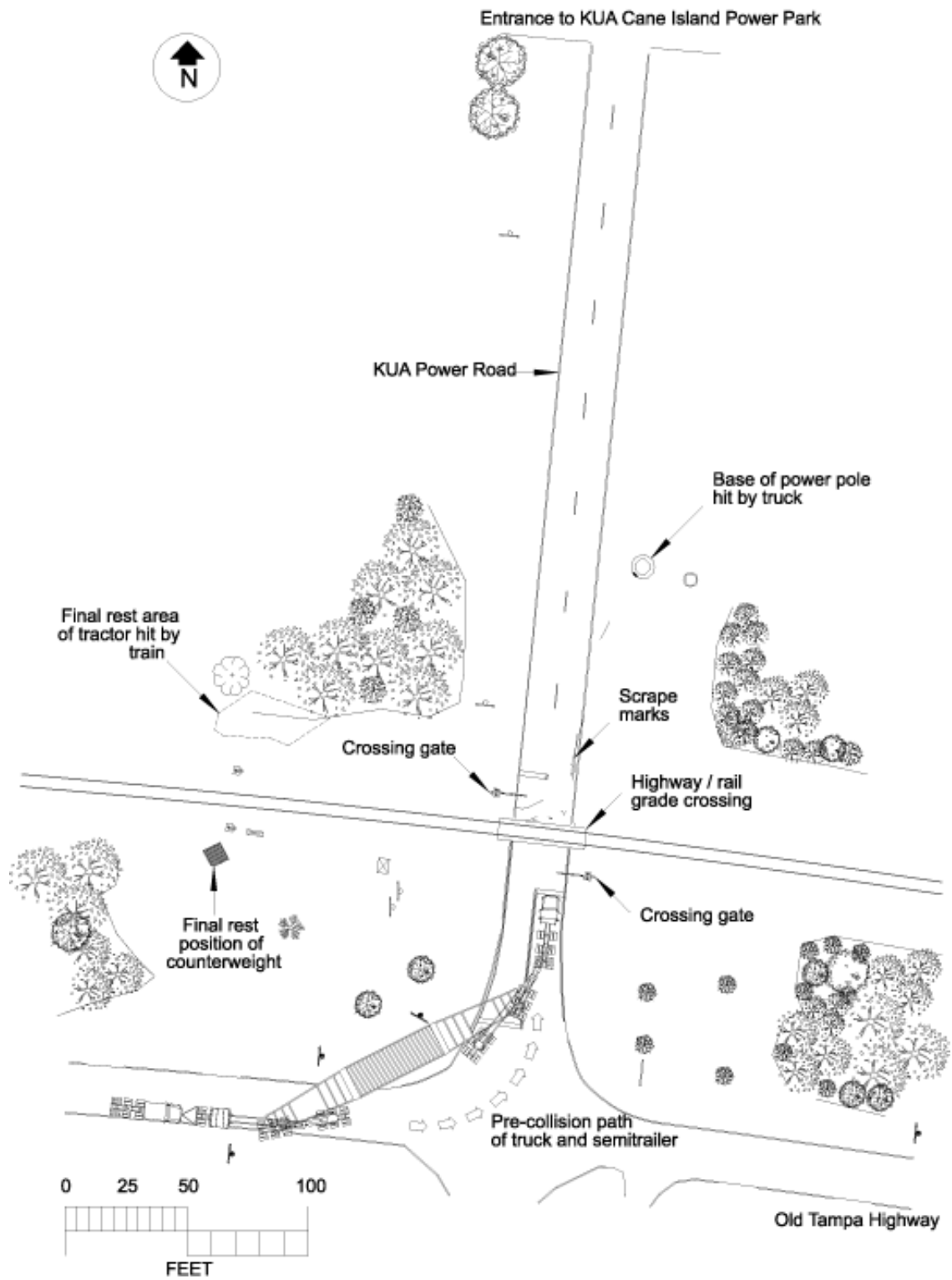


Figure 5. Schematic of accident site.



Figure 6. Photograph indicating utility pole guide wire and stop sign.

The auxiliary operator stated that as the center portion of the trailer traversed the crossing, the frame rails scraped the surface of the roadway. (See figure 7.) The vehicle did not hang up on the crossing. Convoy crewmembers stated that the crossing lights flashed and the bell activated. The auxiliary operator observed a train approaching from the east and then heard the train horn. The vehicle had not yet cleared the crossing, and the auxiliary operator notified the truckdriver by radio of the approaching train. The auxiliary operator then jumped from the rear control station. The train struck and sheared off the pusher truck tractor, which was located directly behind the rear control station. (At the time of the accident, this truck tractor was being towed.) The rear portion of the trailer swung toward the east, left the paved surface of the roadway, and struck a concrete stanchion supporting an electrical tower, where it came to rest.

The truckdriver stated that he proceeded across the tracks at 1 mph until the auxiliary operator notified him of the approaching train. He attempted to change gears in an effort to increase speed to 3 mph, and he believed he was in fourth gear-low when the train struck the combination vehicle.

Intersection with
Id Tampa Highway

To power
plant entrance _____

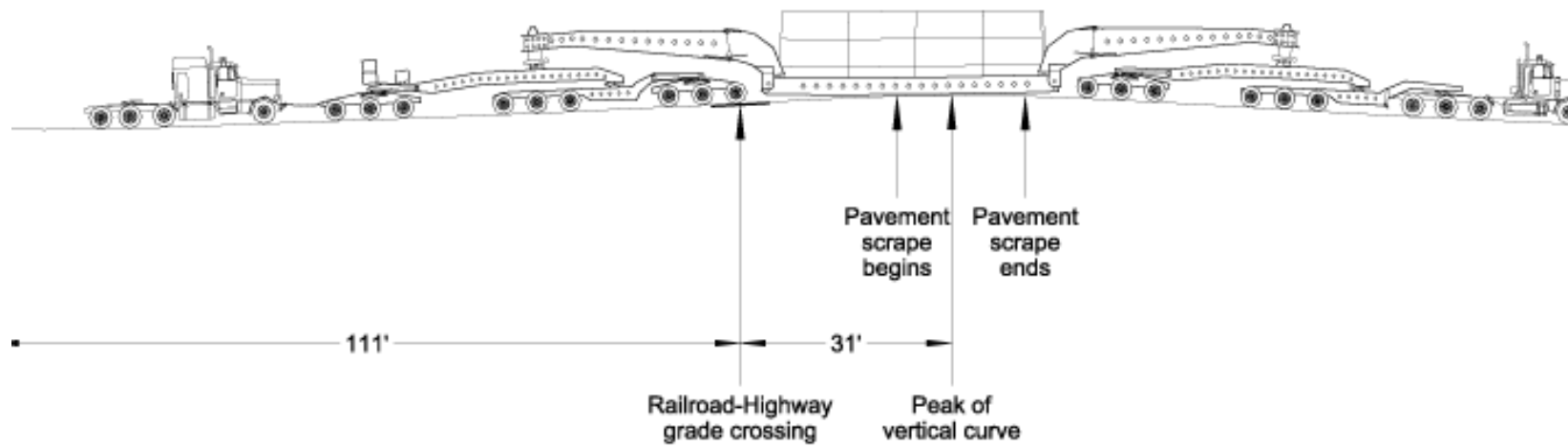


Figure 7. Accident grade crossing profile showing where trailer scraped pavement.

Train Events Preceding the Accident

According to the train crew, the 168-mile trip from Jacksonville, Florida, was uneventful before the accident. The engineer stated that as the train approached milepost 816, he observed highway traffic stopped on the parallel roadway (Old Tampa Highway). He became concerned that something was wrong at the next grade crossing (accident crossing), which was out of sight beyond a curve to the left. He said that he thought that automobiles might be stopped on the crossing due to an accident. He was also aware of the 1993 highway-rail grade crossing accident⁸ at the entrance to the power plant. The engineer made a service application of the train brakes and sounded numerous short blasts on the locomotive horn.

The engineer stated that he looked through the trees on the left side of the track and saw a large red truck, moving in the direction of the crossing, which he thought might be near the crossing. The engineer said that he made an application of the train brakes before he could directly see the crossing or the truck on the crossing, and locomotive event recorder data indicated that the engineer began braking about 1,592 feet before the crossing. Postaccident laser transit mapping of the area showed that an unobstructed view of the crossing did not become available until about 1,152 feet before the crossing. With the train in emergency braking, the engineer saw that the truck was moving slowly on the crossing as the locomotive came out of the curve. The engineer stated that he and the assistant engineer, believing a collision was imminent, got onto the cab floor and braced for the impact.

After the collision, the locomotive and all train cars remained upright on the rail, and the train remained coupled. After the train came to a stop, the engineer used the CSXT emergency “tone 9” radio procedure to contact the CSXT train dispatcher.

Emergency Response

The CSXT train dispatcher contacted the CSXT Police Communications Center, which contacted the local emergency services. All crewmembers indicated that emergency responders arrived at the accident scene quickly. The Osceola County (Florida) emergency services were notified of the accident at 4:40 p.m. The Osceola County Sheriff’s Department dispatched 16 officers and 2 Florida Highway Patrol police vehicles. The fire department dispatched three fire engines, seven ambulances, two hazardous materials specialty units, five staff/supervisors, and two service vehicles (one with portable light towers and one food service truck). The first law enforcement officer arrived at 4:47 p.m.; three fire department vehicles and the first ambulance arrived at 4:52 p.m.

⁸ National Transportation Safety Board, *Collision of Amtrak Train No. 88 With Rountree Transport and Rigging, Inc., Vehicle on CSX Transportation, Inc., Railroad Near Intercession City, Florida, November 30, 1993*, Highway Accident Report NTSB/HAR-95/01 (Washington, DC: NTSB, 1995).

Two emergency medical technicians boarded the locomotive and examined the engineer and assistant engineer. Emergency medical technicians also searched the train cars for injured passengers. One passenger fell as the train passengers were being evacuated and was transported to an area hospital. The Osceola County Fire Chief reported that of the 83 passengers and 4 crewmembers on the train, 3 were transported to area hospitals for observation.

At 5:05 p.m., firefighters requested that power to the train be turned off. Hazardous materials units cleaned up approximately 600 gallons of spilled diesel fuel. The fire department officially completed its duties at 3:42 a.m. on November 18, 2000, and departed the accident site.

The Osceola County Fire Chief stated that the Osceola County Fire Department has a railway plan that specifically addresses railway transportation accidents. He further indicated that the response plan was written in the early 1990s and has not been updated.

Injuries

No injuries occurred as a result of this accident. (See table 1.)

Table 1. Injuries.

Injuries	Truckdriver	Convoy crew	Train crew	Train passengers	Total
None	1	4	4	83	92
Total	1	4	4	83	92

Damages

The collision resulted in moderate damage to the locomotive (see figure 8) and brake rigging damage to the baggage car. The pusher tractor was destroyed. (See figure 8a.) (See table 2.)

Table 2. Damages.

Equipment	Amount
Locomotive and baggage car	\$125,000
Signal and crossing warning devices	\$ 77,000
1993 Peterbilt tractor (pusher tractor)	\$ 25,000
Total	\$227,000



Figure 8. Amtrak locomotive after collision.



Figure 8a. Rear view of pusher tractor after collision.

Truck Information

The 23-axle tractor-combination vehicle consisted of a truck tractor, a heavy-haul trailer, and a pusher tractor. (See figure 1.)

The 4-axle tractor was a 2001 Peterbilt equipped with a Caterpillar 600 horsepower diesel engine and an Eaton/Fuller 18-speed transmission. The 15-axle, 2000 model heavy-haul trailer, manufactured by Diamond Trailers, Inc., of Shandon, Ohio, consisted of a three-axle “jeep”;⁹ a three-axle “wing dolly;” a cargo deck (attached to the wing dollies by hydraulic towers [lift station]); a six-axle “steerable dolly,” which contained a 25-horsepower motor and hydraulic pump to steer the unit and the operator’s control platform; and another three-axle wing dolly.

The four-axle rear pusher tractor was a 1993 Peterbilt equipped with a concrete counterweight that was attached to the tractor’s fifth wheel by a kingpin. The counterweight was approximately 8 feet by 9 feet 6 inches high, with an 18-inch-high steel cage on top for storage. The tractor weighed about 23,000 pounds and the counterweight weighed about 20,000 pounds.

The normal operating height of the cargo deck was 8 inches; the deck could be elevated an additional 24 inches to provide a total ground clearance of 32 inches. The vehicle’s measured length was: tractor (22 feet), trailer (168 feet), tow bar (6 feet), and pusher tractor (29 feet). The normal operating speed of the combination vehicle was greater than 10 mph.

No mechanical deficiencies were noted on the truck-tractor combination vehicle during the Safety Board’s postaccident inspection. The 1993 Peterbilt tractor was extensively damaged following impact with the Amtrak locomotive. The right front tire/wheel and the suspension of the rearmost three-axle steerable dolly were damaged when the dolly struck the concrete base of a utility pole. The counterweight separated from the tractor at impact and struck the Amtrak locomotive in the front between the headlight and coupler device.

Train Information

The 10-car train was powered by a single P-42 locomotive¹⁰ AMTK 65 and consisted of Heritage baggage car 1242; dorm lounge 2505; Amtrak Viewliner sleepers 62035 and 62026; Heritage diner 8509; Amfleet lounge 28007; and Amfleet 59-passenger coaches 25070, 25037, 25106, and 25060. The train, including the locomotive, was about 904 feet long.

⁹ The term *jeep* denotes various configurations of long-frame and short-frame dollies when they are combined to accommodate the weight of a load. A jeep dolly unit is usually positioned at each end of the cargo bed.

¹⁰ General Electric Transportation Systems manufactured the P-42 in Erie, Pennsylvania, in 1997.

Truckdriver Information

The 46-year-old truckdriver held a valid Texas class A commercial driver's license (CDL) with endorsements¹¹ for tank vehicles and vehicles required to be placarded for hazardous materials. (No special endorsement was required for the accident vehicle.) His CDL contained corrective lens restrictions. His valid medical certificate was due to expire May 6, 2002. His 5-year driving record indicated no traffic collisions and two traffic violations. Both violations, failure to obey a traffic control device in Michigan (August 21, 1998) and speeding in Georgia (April 22, 2000), were while operating a commercial vehicle.

The truckdriver began working for Molnar in December 1998. His employment application listed five previous employers for whom he had operated heavy-haul vehicles from 1995 to 1998. Before 1995, he owned his own trucking business (Bartles, Inc.). According to the truckdriver, he had 27 years of truck driving experience, including 18 years in heavy-haul driving. Since working for Molnar, he had been subject to one random drug screen on November 19, 2000, with negative results.

The Safety Board reviewed the driver's logbook. The entries for 30 days before the collision indicated no violation of the hours-of-service rules under 49 *Code of Federal Regulations* (CFR) 395. He said that he had driven the accident combination vehicle (tractor and semitrailers) on "several" other occasions.

Pilot Car Drivers/Truck Crew Information

At the time of the accident, three pilot cars were part of the convoy. An auxiliary driver was operating the controls at the rear of the semitrailer.

A driver from Larry's Escort Service was the lead pilot car driver during the trip from the Florida/Georgia border to the accident site. Molnar hired him when the convoy reached the border and Florida Office of Motor Carrier Compliance Weight Enforcement Program officials found that one of two Molnar pilot car drivers escorting at the time did not have Florida pilot car certification. The lead pilot car driver stated that he had been in the pilot car business for 2 years and had completed the Florida certification course.¹² That course did not cover railroad notification. He led the convoy over three other highway-rail grade crossings in Florida but did not notify the railroad prior to any of the crossings. He stated that he was unaware of the Florida requirement that vehicles in a certain configuration contact the railroad before crossing the tracks (Florida State Statute [FSS]

¹¹ Under 49 *Code of Federal Regulations* 383.93, the endorsements for a commercial driver's license include (1) double/triple trailers, (2) passenger-carrying vehicles, (3) tank vehicles, or (4) vehicles required to be placarded for hazardous materials.

¹² The Florida pilot car certification program consisted of completing an 8-hour defensive driving class and an 8-hour pilot/escort driving class. The University of Florida Transportation Safety Transfer Center administered a test.

316.170). He said he had escorted “numerous” loads over railroad tracks and had never known of the railroad being notified by the transporting company or of the railroad sending a flagger to permit the vehicle and load to cross the tracks. At the time of the collision, the lead pilot car driver was performing traffic control functions as the combination vehicle negotiated the turn onto the grade crossing.

A full-time Molnar employee operated a Molnar pilot car (pickup truck) during the accident trip from Utah to Florida. She had pilot car certificates from Virginia, Utah, Colorado, Kansas, Florida, and Oklahoma. She also had a valid Texas class A CDL and occasionally drove the second tractor during this trip.

A second full-time Molnar pilot car driver, who has since left the company, also operated a pilot car. He held pilot car certificates from Colorado and Kansas and was driving a pilot car at the time of the collision. He was not performing pilot car functions because he did not have Florida pilot car certification.

Another Molnar employee (the auxiliary driver) was operating the hydraulic levers at the rear of the semitrailer that activate the ground clearance devices for the semitrailers and the steerable dolly. A permanent resident of Budapest, Hungary, he was the nephew of the owner and was staying with his uncle on a work visa. He had a valid international truckdriver’s license but did not drive a truck during this trip. He has returned to Hungary.

Motor Carrier Information

Molnar, headquartered in Athens, Texas, was registered with the Federal Motor Carrier Safety Administration (FMCSA) as an interstate carrier of general freight (machinery and oversize/overweight objects). The owner started the company in 1973. For the first 24 years, the company leased itself to other transporters; in 1996, it began independent operations. Molnar employed eight full-time drivers and operated a fleet of 17 trailers and semitrailers and 13 power units (tractors). The company also owned three pickup trucks used in pilot car operations. It employed one full-time mechanic, who had been with the company for 15 years.

According to the Molnar Safety Director, the company hired only drivers that were experienced in heavy hauling. The safety director provided the following information about Molnar operations. Drivers were paid by the week. They were required to stay in a motel each night while on the road and given \$45 per diem for the expense. The company experienced a 50-percent driver turnover rate each year due to the stress of long absences from home and the difficult work of driving and securing the loads. Most of the remaining Molnar truckdrivers had been employed for more than 10 years. The company did not have a formal training program for its drivers. It evaluated new drivers by sending an experienced driver with them for a few weeks to determine how they drove the vehicles. Safety information was passed along periodically to individual drivers at the home terminal.

Motor Carrier Oversight

The FMCSA conducted two compliance reviews on Molnar. The first, on July 21, 1999, resulted in a “Satisfactory” rating. On February 17, 2001, after the accident, the FMCSA conducted a second compliance review, which also resulted in a “Satisfactory” rating. The remarks section of part C of the compliance review, dated February 27, 2001, stated:

Molnar received Permit #033803 from the Florida Department of Transportation [FLDOT] to transport an oversize/overweight load (based on the carriers description of the load and vehicle). Item one of the permit specified, “Movement shall be in compliance W/FS 316.08, 316.170 & F.A.C. 14-26.” Molnar explained that before entering Florida, it attempted to find out what the item one statement meant by calling its permitting service, State Permit of Canton, Ohio. (Note: Molnar did not receive the Florida permit through State Permit, but rather directly from the FLDOT. State Permit could not secure this permit for Molnar because of the size of the load.) Molnar called his permitting service instead of the FLDOT because they were easier to get a hold of and they had provided Molnar with reliable information for over 10 years. Molnar said that State Permit advised them that FSSs 316.08 and 316.170 pertained to Molnar giving “truthful information about the load dimensions and description.” After the collision with the train, Molnar was advised by the Florida Highway Patrol that these statutes actually required Molnar to notify an authority of the railroad of an intended crossing so that the railroad could provide proper protection at the crossing. Molnar was subsequently cited for the violation and fined by the governing jurisdiction of the location of the crash.

In the February 2001 review, the FMCSA cited the company for violating 49 CFR 392.2 – Violating a Local Law or Ordinance, specifying FSS 316.170, which pertained to large vehicles crossing railroad tracks. According the safety director, Molnar was appealing this citation.

The SAFER report,¹³ dated June 2, 2001, indicated that the company had a vehicle out-of-service rate of 23.4 percent (national average is 25.4 percent) and a driver out-of-service rate of 7.5 percent (national average is 8.2 percent). Molnar had three reportable collisions in the previous 24 months (two injury and one tow away).

Truckdriver Training Module

The development of a truckdriver training tool is the subject of discussions between the FMCSA Southern Service Center and the Federal Railroad Administration (FRA) Office of Safety in Atlanta, Georgia. According to FMCSA and FRA officials, they plan to develop a brochure, video, or Web site that addresses the dangers of grade crossings and the new FMCSA regulations regarding disqualification for highway-rail grade crossing violations. The new regulations, found in subpart D–Driver Disqualifications and Penalties (49 CFR 383.51), list six disqualifying offenses at

¹³ The SAFER report was created by the Federal Motor Carrier Safety Administration to provide basic carrier information for the public. Access is through <www.safersys.org> or <www.safersys.org/snpquery.asp>.

highway-rail grade crossings. The regulations at section (vi), "For all drivers, failing to negotiate a crossing because of insufficient undercarriage clearance," state that the first violation carries a 60-day disqualification, the second violation within a 3-year period carries a 120-day disqualification, and the third violation within a 3-year period carries a disqualification penalty of at least 1 year. This regulation becomes effective October 2002.

Train Crew Information

The train crew consisted of an engineer, an assistant engineer, a conductor, and an assistant conductor, all of whom were regularly assigned to Amtrak train 97. Each crewmember was qualified on the route over which train 97 operates. The engineer and assistant engineer met the requirements of Federal regulations for certified locomotive engineers and were in possession of the current *CSXT Operating Bulletin* and the CSXT Job Briefing Checklist, which was completely filled out. The train was operating under *CSXT Train Bulletin 18803*.

Railroad Information

Amtrak operates six scheduled passenger trains daily, including holidays, on the CSXT Sanford Subdivision. Four trains (New York City to Miami) operate over the accident crossing. Two originate or terminate in Orlando, which is north of the crossing. These trains usually contain the same number of cars and similar equipment. According to the DOT-AAR Highway-Rail Grade Crossing Inventory, 10 freight trains also operate over the crossing daily.

Accident Site Information

Roadway

The accident occurred on KUA Power Road (also known as Bobroff Road), which is a rural, private access, undivided, 22-foot-wide, two-lane, asphalt roadway about 3 miles northwest of the Intercession City city limits. On April 26, 1993, KUA entered into an agreement with CSXT to provide access to its new combustion turbine power plant. The agreement enabled KUA to construct, use, and maintain a private road from Old Tampa Highway across the CSXT track and right of way to the power plant. According to the agreement, CSXT installed active warning devices at the grade crossing. KUA Power Road opened on August 5, 1993, and is the only entrance into the power plant.

The November 1993 Intercession City accident¹⁴ involved a 184-foot-long vehicle, loaded with an 82-ton turbine, which was stopped on the private crossing while the crew was raising the height of the cargo deck. An Amtrak train carrying 89 passengers struck the side of the cargo deck and the turbine. Six people sustained serious injuries, and 53 people suffered minor injuries. Damages exceeded \$14 million. Investigators found that the carrier had not notified the railroad of its intent to cross the track before the accident.

The crossing active warning devices included railroad crossbucks signs, a bell, flashing light units, and two reflectorized gates, which were approximately 11 feet from the north and south edges of the track. The pavement markings included a series of 4-inch-wide broken reflectorized yellow lines, which separated the northbound and southbound lanes, and 3-inch-wide solid reflectorized white edge lines. In addition, about 20 feet north and south of the grade crossing were two 12-inch-wide solid white stop bars. The pavement markings did not show any irregularities and met the line width and space requirements of the *Manual on Uniform Traffic Control Devices* (MUTCD).¹⁵ A stop sign was at the northwest corner of the intersection of KUA Power Road and Old Tampa Highway.

The DOT-AAR Highway-Rail Grade Crossing Inventory¹⁶ estimated the average daily traffic count at 11 vehicles, 6 percent of which were estimated to be trucks. According to KUA, 30 employees worked at the plant. The posted speed limit on the private roadway was 35 mph. The maximum authorized track speed was 79 mph for passenger trains and 60 mph for freight trains.

Grade Crossing

The centerline of the active grade crossing (DOT No. 643879N) was 111 feet north of the north edge of Old Tampa Highway and 350 feet south of the gate into the KUA power plant. The northbound approach grade was 3.3 percent, and the departure grade was -4.5 percent. The superelevation at the crossing was 5.36 percent. At a point 30 feet from the south rail, the roadway was 2.53 inches above the plane of the crossing. At a point 30 feet from the north rail, the roadway was 6.34 inches below the plane of the crossing. (See figures 9 and 10.) When built in 1993, the grade crossing was within the American Association of State Highway and Transportation Officials (AASHTO) guidelines. The American Railroad Engineering Association guideline and the 1990 edition of the AASHTO guidelines for roadway vertical profiles at highway-rail grade crossings¹⁷ state:

¹⁴ NTSB/HAR-95/01.

¹⁵ The *Manual on Uniform Traffic Control Devices* is approved by the Federal Highway Administration as the standard for all streets and highways in accordance with 23 *United States Code* sections 109 (b), 109 (d), 402 (a) and 23 *Code of Federal Regulations* 1204.4.

¹⁶ Accessed November 28, 2000, and December 12, 2001.

¹⁷ *A Policy on Geometric Design of Streets and Highways*, American Association of State Highway and Transportation Officials, 1990, adopted as a Federal Highway Administration standard in April 1993 at 23 *Code of Federal Regulations* 625.4.

Acceptable geometrics necessary to prevent drivers of low-clearance vehicles from becoming caught on the tracks would provide the crossing surface at the same plane as the top of the rails for a distance of 2 feet outside the rails. The surface of the highway should also not be more than 3 in. higher nor 6 in. lower than the top of the nearest rail at a point 30 feet from the rail unless track superelevation dictates otherwise.



Figure 9. Photograph of accident highway-rail grade crossing.



Figure 10. Photograph of accident highway-rail grade crossing.

In April 2001, AASHTO revised its guidelines¹⁸ for roadway vertical profiles at rail grade crossings. They now state:

In some instances, the roadway alignment may not meet acceptable geometrics for a given design speed because of restrictive topography or limitations of right-of-way. To prevent drivers of low-clearance vehicles from becoming caught on the tracks, the crossing surface should be at the same plane as the top of the rails for a distance of 0.6 meter (2 feet) outside the rails. The surface of the highway should also not be more than 75 millimeters (3 inches) higher or lower than the top of nearest rail at a point 9 meters (30 feet) from the rail unless track superelevation makes a different level appropriate as shown in figure 6. [See figure 11.] Vertical curves should be used to traverse from the highway grade to a level plane at the elevation of the rails. Rails that are superelevated, or a roadway approach section that is not level, will necessitate a site-specific analysis for rail clearances.

Based on the 2001 guidelines, the crossing is a humped crossing.¹⁹ Because it was built in 1993, it is not required to conform to the current guidelines. (See figure 11.)

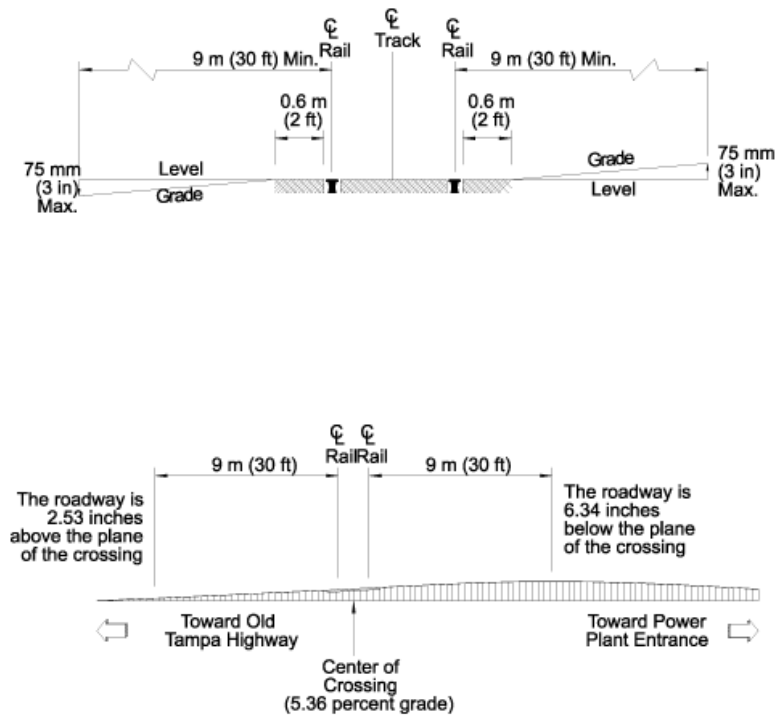


Figure 11. Schematic illustrating AASHTO guidelines and accident grade crossing profile.

¹⁸ *A Policy on Geometric Design of Highway and Streets*, Fourth Edition, American Association of State Highway and Transportation Officials, 2001.

¹⁹ The *Manual on Uniform Traffic Control Devices* refers to humped crossings as highway profile conditions sufficiently abrupt to create a “hang-up” situation for long wheelbase vehicles or low-ground clearance trailers.

Emergency Signs

Metal emergency call number signs, approximately 12 by 6 inches, were mounted on each crossing gate vertical pole. (See figures 12 and 13.)



Figure 12. Photograph of metal emergency call number sign.



Figure 13. Photograph of metal emergency call number sign.

According to CSXT, the signs were installed in 1997. The signs read as follows:

CSX TRANSPORTATION
TO REPORT STALLED VEHICLE BLOCKING CROSSING OR OTHER
EMERGENCY
CALL 1-800-232-0144
Ref. Crossing - ID #643 879N
Located at mile post A 816.27

Until the 2000 edition, the MUTCD provided no guidance for emergency call number signs. Signs I-13 and I-13a, created in response to Safety Recommendation H-96-003 (see appendix B), were authorized in January 2001 and are required to have a blue background with white lettering. (See figure 14.) According to the Federal Highway Administration (FHWA) Office of Transportation Operations, the size criteria for sign I-13 are 29.5 inches high and 29.5 inches wide and for sign I-13a, 17.7 inches high and 29.5 inches wide. No criteria for placement have been developed.

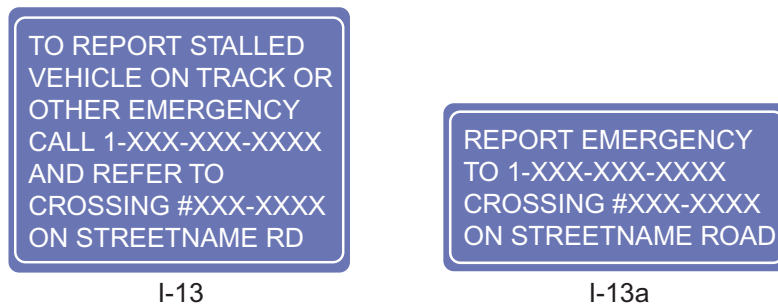


Figure 14. Signs I-13 and I-13a.

Signals

The crossing was equipped with gates, eight 12-inch diameter flashing lights, and a bell. The warning devices were controlled by a Harmon phase motion detector designed to provide a minimum of 25 seconds of warning time for trains traveling at the maximum authorized speed of 79 mph. The north approach track circuit (for southbound trains) extended approximately 3,356 feet from the center of the crossing and was terminated with a narrow band shunt (326 hertz [Hz]). A whistle board was positioned by the wayside, approximately 1,898 feet from the center of the crossing. The south approach track circuit (for northbound trains) extended approximately 3,344 feet from the center of the crossing and was also terminated with a narrow band shunt (326 Hz). A whistle board for northbound trains was positioned 2,186 feet from the center of the crossing. (See figure 15.)

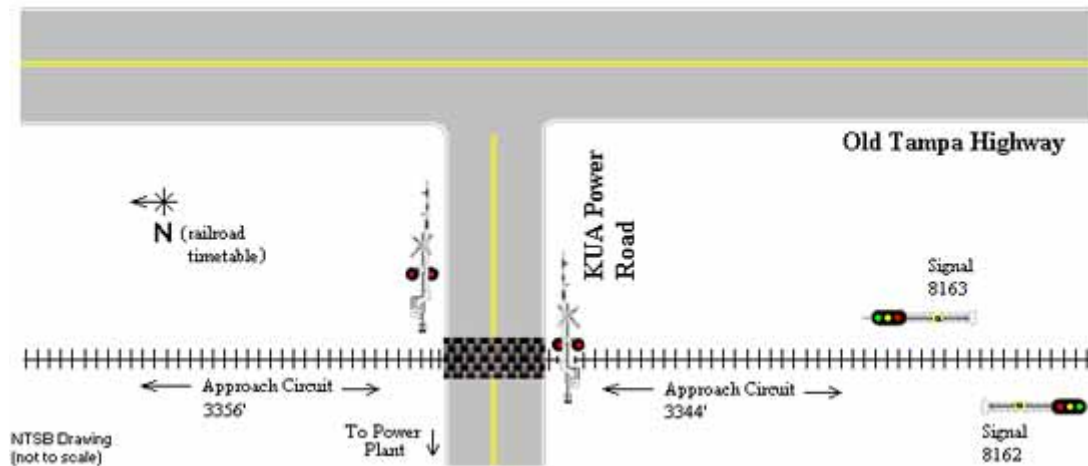


Figure 15. Crossing signals.

Track

The CSXT Sanford Subdivision of the Jacksonville Service Lane was predominately a single-track main line with passing sidings. The track structure consisted of 122-pound continuous welded rail laid in 1988. At the grade crossing, the track had a grade of 0.07 percent, descending to the south, with a 1-degree left curve and 3 inches of elevation (5.36-percent superelevation). CSXT maintains the track to meet FRA Class 4 Track Safety Standards. The last track inspection before the accident occurred earlier on the day of the accident. The inspection records did not show any defects or conditions that required repair or slow orders.

Toxicological Tests

The truckdriver was not tested for alcohol and drugs until 36 hours after the accident.²⁰ The Molnar Safety Director stated that the regulatory time limits were not met because a testing facility that had a drug testing kit²¹ could not be located near the accident site. (Molnar drivers are now required to carry a drug testing kit in their vehicles.) The truckdriver's toxicological test results were negative for alcohol and drugs. Under 49 CFR 219.201 (B), the train crew was not tested, nor were they required to be tested. Train crews are not normally tested as a result of highway-rail grade crossing collisions.

²⁰ Under 49 *Code of Federal Regulations* 382.303, a driver shall be tested for alcohol within the first 2 hours and for drugs within the first 32 hours after a qualifying incident. Testing is required when a traffic collision occurs involving a commercial motor vehicle that results in (1) fatality, (2) an injury requiring treatment away from the scene, and (3) the truckdriver receives a citation by the police, or (4) a vehicle sustains damage requiring it to be towed from the scene.

²¹ A drug testing kit includes the required items for conducting a drug test, such as a sterile specimen bottle, tamperproof seals, and shipping container. (See 49 *Code of Federal Regulations* 40.49 and 40 Subpart E.)

Tests and Research

After the accident, the Safety Board conducted operational tests on the active crossing traffic control devices (signals, bells, lights, and gates) and found no anomalies.²² The north approach circuit measured 3,356 feet. The testing showed that trains traveling at the maximum authorized speed of 79 mph would take 29 seconds to traverse the approach circuit and occupy the crossing. The train detection equipment required approximately 3 to 4 seconds to recognize an approaching train and activate the warning devices. This configuration provided a minimum warning time of 25 seconds before the arrival of a train at the crossing. Slower trains received longer warning times.

Train locomotive 65 had a Pulse Integrated Function Control solid-state recorder (part number 17853B and serial number 0172201). Amtrak personnel downloaded the recorder in the presence of Safety Board investigators, and the floppy diskette was loaded into the Safety Board rail recorder readout station for further study.

The data from the recorder indicate that at recorder time 16:39:53 the train speed was 76 mph, the airbrake pressure was 110 pounds per square inch (psi), the brake cylinder pressure was 0 psi, the independent brake was released, the throttle position was 5, the horn was on and was intermittent throughout the rest of the accident trip, the bell was on, the pneumatic control switch was closed, and the airbrake handle was in the released position. At 16:39:54, the airbrake handle was placed into the minimum application position. At 16:39:55, airbrake pressure decreased to 109 psi, and the airbrake handle was placed into the suppression position.

Between 16:39:54 and 16:40:01, airbrake pressure decreased from 110 psi to 0 psi. At 16:39:57, the throttle position changed from 5 to idle. At 16:39:59, the train speed was 74 mph, the brake cylinder pressure changed from 0 psi to 1 psi, the engineer-induced emergency was activated, and the airbrake handle was placed in the emergency position. At 16:40:00, the pneumatic control switch was opened. Between 16:39:58 and 16:40:04, the brake cylinder pressure increased from 0 psi to 90 psi. At 16:40:02, the throttle position changed from idle to dynamic/idle. Between 16:39:59 and 16:40:09, the train speed decreased from 74 mph to 57 mph. All further speed data indicate a train speed of 0 mph.

Other Information

Cane Island Power Park

The KUA Cane Island Power Park in Intercession City is owned by the KUA and the Florida Municipal Power Agency. The 1,027-acre facility currently has three power generation units. Construction for units one and two started in May 1993 (cost \$121 million) and commercial operation began in January and May 1995, respectively.

²² See 49 *Code of Federal Regulations* 234.223, "Gate Arm," and 49 *Code of Federal Regulations* 234.22, "Activation of Warning System," for the operating standards.

Construction for unit three started in October 1999 (cost \$136 million) and commercial operation began in June 2001. KUA contracted with Black & Veatch²³ to serve as architect-engineer and construction manager for both construction projects. The November 30, 1993, and November 17, 2000, accidents involved oversize/overweight loads that were part of the construction process.

After the 1993 accident, according to a May 7, 2002, e-mail from KUA, the following changes were made to its procedures:

KUA, by contract, requires that suppliers of equipment to the site observe and comply with all applicable laws, including state and federal statutes. Suppliers are also required to obtain all licenses and permits necessary to the performance of their work under the contract. Additionally, KUA, through its Site Manager, Black & Veatch, established a construction management system which required all suppliers to provide to the Site Manager production, scheduling, and shipment information for all equipment to be delivered to the site. Finally, KUA, through its Site Manager, Black & Veatch, contacted the supplier prior to delivery, in order to ensure that all necessary permits, including the CSX crossing permit, had been obtained by the supplier and/or its transport company prior to delivery of the equipment to the site. Black & Veatch was informed that all permits necessary for delivery of the equipment to the site had been obtained.

The generator involved in the November 17, 2000, accident was built by Mark Steel, Salt Lake City, Utah, and later installed by Thermal Engineering International (TEi), Joplin, Missouri. TEi hired Molnar to haul the generator from Salt Lake City to the construction site. Safety Board investigators found that TEi and Molnar disagreed with one another about whether they exchanged information on railroad notification requirements; the fact is that no one notified the railroad.

Permit Information

Molnar obtained specialized moving permits from 10 States: Utah, Wyoming, Colorado, Kansas, Oklahoma, Arkansas, Mississippi, Alabama, Georgia, and Florida. Molnar used State Permits Company, Akron, Ohio, a private permit service, for the Georgia and Mississippi permits²⁴ and obtained the remaining permits directly from the

²³ According to facsimile letter from Black & Veatch senior attorney, dated April 30, 2002:

The “contract between KUA and Black & Veatch” began as a contract between Black & Veatch, Engineers-Architects and the City of Kissimmee, Florida, dated January 17, 1984. In October of 1985, Kissimmee Utility Authority assumed all of the City of Kissimmee’s rights and responsibilities under the Contract. On February 12, 1998, Black & Veatch, Engineers-Architects was dissolved and all services under the contract were assigned to Black & Veatch LLP. On January 1, 1999, all of Black & Veatch LLP’s interest and obligations under the contract were assigned to Black & Veatch Corporation. Therefore, the contract is currently between KUA and Black & Veatch Corporation.

The contract is in the form of a “Contract for Engineering Services,” under which Black & Veatch Corporation was to act as the owner’s engineer and perform construction management. Under the contract, Black & Veatch Corporation had no contractual responsibility for on-site safety.

²⁴ Private permit services are often used to obtain permits by transporters moving loads interstate when the permit process is complicated or the transporting company is unfamiliar with the permitting process for a particular State.

other eight States. Each permit specified the authorized routes, dates, and times for movement of the load. (Table 3 shows the date of issue, maximum dimensions, and fees for the 10 State permits; the size and weight information listed on the permits are maximum allowable dimensions and may not be actual vehicle/load dimensions.)

Table 3. Permit information.

State	Date of issue	Maximum dimensions	Fee
Utah Permit number 028139223	October 11, 2000	Length - 189 feet Width - 15 feet 11 inches Height - legal* Weight - 375,000 pounds	\$450
Wyoming** Permit number 083010107546	October 21, 2000	Length - not specified Width - not specified Height - not specified Weight - not specified	\$3,723.07
Colorado Permit number S065427	October 13, 2000	Length - 188 feet 2 inches Width - 15 feet 11 inches Height - legal Weight - 357,000 pounds	\$127
Kansas Permit number 00065322	October 18, 2000	Length - 188 feet 2 inches Width - 15 feet 11 inches Height - 13 feet 6 inches Weight - 355,000 pounds	\$5
Oklahoma Permit number 2000 111571	October 24, 2000	Length - 188 feet Width - 15 feet 11 inches Height - 13 feet 6 inches Weight - 355,000 pounds	\$1,367
Arkansas Permit number 80022	October 27, 2000	Length - 188 feet Width - 15 feet 11 inches Height - legal Weight - 355,000 pounds	\$2,849
Mississippi Permit number K344959	November 11, 2000	Length - 188 feet 2 inches Width - 15 feet 11 inches Height - 13 feet 6 inches Weight - 355,000***	\$3,997.50
Alabama Permit number 044128	November 14, 2000	Length - 188 feet 2 inches Width - 15 feet 11 inches Height - 13 feet 6 inches Weight - 183,997.8 pounds	\$110
Georgia Permit number S171243	November 15, 2000	Length - 230 feet Width - 15 feet 11 inches Height - not specified Weight - 405,000 pounds	\$500
Florida Permit number MB033803	November 15, 2000	Length - 189 feet Width - 16 feet Height - legal Weight - 355,000 pounds	\$195
<p>*A legal designation for height indicates the vehicle/load is under the State maximum height requirement. **Issued at the Evanston Port of Entry. ***The vehicle was weighed without the second tractor attached at a Mississippi State inspection facility, which showed a gross weight of 337,420 pounds. The vehicle was inspected and weighed only this time during the trip.</p>			

Florida's Railroad Notification Requirement

Some States, including Florida, require that slow-moving (less than 10 mph) or low-clearance (8 to 9 inches) vehicles notify railroads before crossing their tracks. FSS 316.170 states:

No person shall operate or move any crawler-type tractor, steam shovel, derrick, or roller, or any equipment or structure having a normal operating speed of 10 or less miles per hour or a vertical body or load clearance of less than 1/2-inch per foot of the distance between any two axles or in any event of less than 9 inches, measured above the level surface of a roadway, upon or across any tracks at a railroad grade crossing without first complying with this section.

Notice of any such intended crossing shall be given to a station agent or other proper authority of the railroad, and a reasonable time shall be given to the railroad to provide proper protection at the crossing.

Before making any such crossing the person operating or moving any such vehicle or equipment shall first stop the same not less than 15 feet nor more than 50 feet from the nearest rail of the railroad and while so stopped shall listen and look in both directions along the track for any approaching train and for signals indicating the approach of a train, and shall not proceed until the crossing can be made safely.

The Florida ordinance was modeled on the *Uniform Vehicle Code*, Section 11-703, published by the National Committee on Uniform Traffic Laws and Ordinances (NCUTLO).²⁵ According to the “Forward” of the 1987 edition of the *Uniform Vehicle Code*,²⁶ the set of motor vehicle laws was first published in 1926 and was designed and advanced as a comprehensive guide or standard for State motor vehicle and traffic laws. The NCUTLO general counsel said that the railroad notification model law has been in effect for more than 30 years and no information is available concerning the history of the law or how vehicle speed and ground clearance criteria were first determined.

The only information on the Florida permit regarding railroad notification requirements was a statement that the “movement shall be in compliance with W/FS 316.08, 316.170, and F.A.C. rule 14-26.” Neither the text of the referenced statutes was on the permit (or on an attachment) nor was a telephone number listed for contacting the railroad. According to the Molnar Safety Director, the company made several attempts to determine the text of these sections. Molnar called the permit office of the FLDOT and the CSXT and stated that it was unable to get any information from either source. According to Molnar, one agency told the company “go look it up in the local library.” Safety Board investigators called several FLDOT offices (permit, highway, and railroad) and were unable to obtain information regarding the Florida railroad notification requirement.

The Safety Board’s report of the investigation of the November 30, 1993, accident in Intercession City found that when FLDOT issues permits, “it does not advise applicants that Florida law requires operators of certain low-clearance vehicles to provide railroads with advance notification of the applicant’s intent to travel over grade crossings.” The Safety Board recommended that AASHTO encourage the States to revise their permit

²⁵ The National Committee on Uniform Traffic Laws and Ordinances is a private, nonprofit membership organization dedicated to providing uniformity of traffic laws and regulations. Reference: <www.ncutlo.org/news.html>.

²⁶ *Uniform Vehicle Code and Model Traffic Ordinance 1987*, National Committee on Uniform Traffic Laws and Ordinances, Evanston, Illinois.

documents to state that compliance with this notification requirement is a condition of permitting. On June 28, 1996, Florida revised its permit form to include the reference to the applicable statute.

In addition, the FLDOT Railroad Division published the brochure *Florida Department of Transportation Low-Clearance Information – Don't Get Hung Up On The Tracks*.²⁷ The brochure lists the railroad contact telephone numbers and emergency police and highway patrol telephone numbers and also includes the text of FSS 316.170. A FLDOT Railroad Division representative said that the brochure was provided to permit applicants through the FLDOT permit office. According to a representative of the FLDOT permit office, the brochure was available at one time only, some time before 1997, and, not being in stock, is not sent to permit applicants.

This representative also indicated that from May to July 2001, the permit office sent a one-page document with the text of FSSs 316.170 and 316.550 (requirement to obtain a permit for oversize vehicles) to the private permit service companies with which they conduct business. In addition, the permit office attaches this document to each issued permit. (See appendix C for the text of the FLDOT brochure and the one-page document.)

According to Florida law:

- fines for violating permit dimensions range from \$40 to \$1,000 (FSS 316.516).
- maximum fine for operational or safety permit violation [such as being off route] will not exceed \$1,000 (FSS 316.550).
- fine for violating FSS 316.170 is \$60 (FSS 318.18).

Railroad Grade Crossing Notification Requirements

The Safety Board examined the railroad notification requirements of the 10 States traversed by the slow-moving, low-clearance vehicle convoy during the movement of this oversize/overweight load. Investigators reviewed four separate sources of information available to a motor carrier when planning the movement of an oversize/overweight load: (1) the permit offices from the 10 States that issued permits for this accident load; (2) the Specialized Carriers & Rigging Association (SC&RA) guide entitled *Oversize/Overweight Permit Manual*²⁸ (updated quarterly, according to the SC&RA, from information provided by the individual State permit offices); (3) the FRA publication entitled *Compilation of State Laws and Regulations Affecting Highway-Rail Grade Crossings*²⁹ (also available on the FRA Web site); and, (4) the text of each State's motor vehicle laws. As shown in table 4, this examination revealed inconsistencies in the information available regarding the railroad notification requirements for the 10 States.

²⁷ Florida Department of Transportation, revised December 1997.

²⁸ Specialized Carriers & Rigging Association, *Oversize/Overweight Permit Manual* (Fairfax, Virginia: September 2000).

²⁹ U.S. Department of Transportation, Federal Railroad Administration, *Compilation of State Laws and Regulations Affecting Highway-Rail Grade Crossings*, 3rd edition, January 6, 2000.

Table 4. Comparison of information from four sources regarding railroad notification requirements.

State	State permit office response	SC&RA permit guide	FRA compilation of State laws	State motor vehicle code
Utah	No*	No	No	Yes - section 41-6-98
Wyoming	No	No	No	Yes- section 31-18-602
Colorado	No	Yes	Yes	Yes - section 42-4-708
Kansas	No	Yes**	Yes	Yes - section 8-1554
Oklahoma	No	No	No	None
Arkansas	No	No	Yes	Yes - section 27-51-705
Mississippi	No	No	Yes	Yes - section 63-3-1-13
Alabama	No	No	No	None
Georgia	No	Yes	Yes	Yes - section 40-6-143
Florida	Yes***	Yes	Yes	Yes - section 316.170

*Utah indicated that only a vehicle/load exceeding 16 feet in height, traversing a highway-rail grade crossing having railroad warning lights on a cantilever over a grade crossing, would require the company to notify the railroad.
** Applies only to slow-moving vehicles—speed not specified. However, the text of the Kansas law does include a low-ground clearance provision.
*** The Florida Permit Office indicated that it does not, as a routine, verify that an oversize vehicle will traverse a grade crossing.

Eight of the 10 States have statutes in their motor vehicle codes requiring railroad notification. Of the eight, only one State permit office indicated that the State had such a requirement. The SC&RA publication indicated that four States had a requirement, and the FRA document listed six States as having such a requirement.

The Safety Board also contacted the remaining 40 States in February 2002 about their railroad notification requirements. Among all 50 States, 34 have statutes in their motor vehicle codes that require railroad notification. Of these 34, only 10 State permit offices indicated that a requirement existed in their States. (See appendix D.)

No State requires information about ground clearance or normal operating speed as part of the permit application process. Several State permit office representatives indicated that because such information is not gathered as part of their permit process, they do not know whether a vehicle is a low-clearance or slow-moving vehicle that meets the requirements of the railroad notification statutes. Alaska, Montana, New York, Utah, and Washington have requirements for notifying the railroad before traversing a highway-rail grade crossing based on size or weight dimensions, but not for low-clearance vehicles. Oregon adopted a regulation in 2002 that makes it an offense to obstruct a highway-rail

grade crossing if a vehicle “fails to negotiate the rail grade crossing because of insufficient undercarriage clearance.” (ORS [Oregon Statute] 811.475)

All States have a provision on their permits indicating that transporters are required to comply with all State laws and regulations and that the transporter is responsible for the safe movement of the load on the highways.

CSXT Railroad Notification Program

The CSXT railroad has a program to grant permits to oversize vehicles to pass over railroad crossings in Florida. According to a CSXT project manager, the CSXT has an agreement with the permit section of the FLDOT, under which the FLDOT informs any trucking company applying for a State permit that the company needs to contact the CSXT to obtain the required railroad permits. (According to an FLDOT representative, none of the supervisors in the FLDOT permit offices was aware of any oral or written agreement with the CSXT to provide any information related to the railroad.) The CSXT project manager stated that the CSXT has no other method of receiving notification when oversize vehicles operate over CSXT tracks at grade crossings.

After receiving notice from a trucking company (the railroad requires a minimum 2-week notice), the CSXT issues a permit to the hauling company, charging \$350 for this service, and sends an e-mail to the roadmaster, supervisor-train control, chief dispatcher, train master, and manager-billable expenditures, notifying them of the proposed date and time of the oversize/overweight vehicle move. The appropriate CSXT personnel then make arrangements to protect the move across CSXT tracks. The CSXT railroad further requires the trucking company to contact the roadmaster and the supervisor-train control at least 48 hours before the date of the planned move to verify all arrangements.

Other Railroad Notification Programs

To determine railroad notification practices of other railroads, the Safety Board contacted representatives from the Burlington Northern Santa Fe (BNSF), Canadian Pacific (CP), Norfolk Southern (NS), Union Pacific (UP), and Kansas City Southern (KCS) railroads.

All five railroads had programs to ensure the safe crossing of a slow-moving or low-clearance vehicle when notified of the intended crossing. The BNSF indicated that it also issued a permit to cross when a carrier supplied proof of insurance and release of liability forms. Most railroads indicated that they preferred a week’s notice of an intended crossing but could be flexible depending on the circumstances. Some railroads had internal procedures for alerting those that needed to know about a crossing and sent a flagger to the crossing. Others had the motor carrier or truckdriver call the dispatcher directly when at the crossing and either remain on the telephone until across the tracks or call after completing the crossing.

The KCS said that a vehicle operator can call the 1-800 number posted at the crossing or the number listed on the Web page, both of which are staffed 24 hours a day.

The NS representative indicated that unless a motor carrier knew the correct telephone number, finding and contacting the right person in the railroad would be difficult.

None of these class 1 railroads indicated that a charge is made to the motor carrier for providing safe passage. CP indicated that if it does not have to move signal wires or appliances, a \$500 deposit is required and that if signal devices must be moved and reinstalled, a \$1,000 deposit is required. Once the move is completed, CP returns the balance. All railroads indicated that they charged for damages to track, signal, or warning devices.

The Safety Board compiled the distribution of at-grade highway-rail crossings nationwide. Table 5 shows the number of States in which the railroads operate, the miles of track the railroads own and maintain, the number of at-grade crossings, and the proportion of total at-grade crossings (both public and private) for each railroad.³⁰

Table 5. Distribution of at-grade highway-rail crossings.

Railroad	In number of States*	Miles of track*	Number of at-grade crossings	Proportion of total at-grade crossings
BNSF	28	33,500**	35,229	13.7%
CP	08	2,303***	5,357	2.1%
CSXT	24	42,700	29,821	11.6%
KCS	11	2,728	4,295	1.7%
NS	22	31,900	33,540	13.1%
UP	23	38,654	50,844	19.8%
Other			97,155	38.0%
Total			256,241	100%

*From railroads' Web sites.
 **Route miles.
 ***Miles of track in the United States.

New York's Permit Policy Regarding Railroad Notification

New York is the only State that requires the carrier to demonstrate contact with the railroad before it issues a permit. As part of its investigation of the November 30, 1993, Intercession City accident, the Safety Board interviewed staff members of the New York Department of Transportation (NYDOT) heavy-hauling permit program. As a result of

³⁰ In addition to the railroads' Web sites, the Safety Board consulted the *Railroad Safety Statistics Annual Report 2000*, published by the U.S. Department of Transportation, Federal Railroad Administration, July 2001.

these discussions, according to the program supervisor, the NYDOT examined its program and decided to adopt additional permit requirements to prevent a similar accident from occurring in New York. The NYDOT adopted a policy requiring that trucking companies moving a vehicle 100 or more feet long over railroad crossings provide proof that they had made arrangements with the railroad(s) for safety at those crossings; the State will not grant a permit for movement of the load without such proof. The State reviews the railroad contact information and maintains file copies of the paperwork. The heavy-haul operator is also required to obtain an emergency telephone number for the railroads and to provide this number to the State police who accompany the load. The NYDOT imposes a \$5,000 penalty on a trucking company that uses such a vehicle to transverse a railroad crossing without making prior arrangements for safe passage.

Other Kissimmee Utility Authority Oversize/Overweight Shipments

According to KUA representatives, Black & Veatch arranged for the delivery of oversize shipments involved in the plant construction. Black & Veatch records indicate that 20 oversize shipments arrived in 2000. To arrive at the Black & Veatch construction site, these highway shipments had to pass over the accident crossing. CSXT received notification of seven oversize/overweight shipments before those loads traversed the accident crossing. (See table 6.)

Table 6. Oversize/overweight loads that traversed the accident crossing in 2000.

Black & Veatch description of equipment	Black & Veatch record of arrival	CSXT description of equipment	Date that CSXT provided protection at crossing
Combustion turbine	August 8	Turbine generator components	August 8
Combustion turbine generator	August 10		
		Turbine generator components (two different shipments)	August 11
Tube bundle 7L	August 17		
Tube bundle 6L	August 21		August 21
Tube bundle 7R	August 25		
Tube bundle 6R	August 29	Turbine generator components	August 29
Tube bundle 5L	August 31		
Tube bundle 4L	September 5		
Tube bundle 5R	September 8	Turbine generator components	September 8
Tube bundle 4R	September 11		September 11
Tube bundle 3L	September 13		
Combustion turbine generator step-up transformer	September 14		
Steam turbine generator step-up transformer	September 15		
Tube bundle 3R	September 19		September 19
Tube bundle 2L	September 21		September 21
Tube bundle 2R	September 23		
Tube bundle 1L	September 25		September 25
Surface condenser tubes*	November 17		
		Power plant equipment**	November 21
		Expansion joint	December 15
		Steel tank	December 18
Steam turbine generator	December 29		
<p>*Accident shipment. ** On November 20, the driver of this oversize shipment attempted to proceed over the crossing without making arrangements with the railroad. CSXT employees at the crossing who were making inspections and repairs due to the collision 3 days earlier turned the driver away. This shipment proceeded over the crossing, with protection provided by CSXT, on November 21.</p>			

The September 14 and 15 transformer shipments were transported by Rountree Transport & Rigging, Inc., which operated the truck involved in the November 30, 1993, Intercession City accident. CSXT records indicate that the company did not notify the railroad before traversing this grade crossing in September 2000. On at least 5 of the 12 occasions during 2000 for which CSXT provided protection, the same trucking company delivered the shipments;³¹ the remaining two arrangements involved two different trucking companies. After the oversize shipments were unloaded, the empty vehicle again passed over the accident crossing when departing the facility. According to the CSXT railroad, its flaggers commonly remained at the crossing to provide protection for the return move of the empty vehicle.

Pertinent Florida State Statutes

The FLDOT Deputy General Counsel's interpretation of FSS 316.06 is that it limits State jurisdiction for enacting vehicle laws to public roads and highways and restricts local agencies' jurisdiction to public roads and highways and to those private roadways for which a contract exists between the owner of the private roadway and the local jurisdiction. KUA did not enter into any such contract with a local authority for the accident grade crossing.

In its 1998 *Passive Grade Crossing Safety Study*, the Safety Board issued Safety Recommendation H-98-35 to the States, including Florida, to determine within 2 years, in conjunction with the U.S. Department of Transportation, governmental oversight responsibility for safety at private highway-rail grade crossings and ensure that traffic control on these crossings meets the standards within the *Manual on Uniform Traffic Control Devices*. Florida stated in a June 7, 2000, letter that it did not have jurisdictional authority over private crossings. The Safety Board, in its October 16, 2000, response, encouraged Florida to introduce legislation to expand its authority to include private crossings. Because Florida responded in a November 9, 2000, letter that it would consider a legislative initiative to expand its highway-rail crossing authority when developing its legislative package the following year, the Safety Board classified Safety Recommendation H-98-35 "Open-Acceptable Response" on April 30, 2001, pending receipt of further information on the subject. As of June 19, 2002, according to the Florida Office of Legislative Information, no legislation regarding State authority over private crossings had been introduced.

Federal Highway Administration's Contracts

The FHWA Office of Safety has contracted for development of a system to warn low-clearance vehicles of any incompatibility with a humped crossing. The objective of the contract is to develop concepts using sensor technology, signage, warning devices, and education to alert drivers of low-ground clearance vehicles to a humped crossing ahead and to provide information for an alternative route. The first phase of the project,

³¹ The company's Safety Director told Safety Board investigators that he notified the railroad because he was "familiar with the circumstances of the November 1993 collision at the crossing and wanted to be sure that the movement of oversize shipments could travel over the crossing in a safe manner."

“Evaluation of Sensors for Measurement of Low-Clearance Vehicles,” began in September 2001 and was completed in June 2002. The FHWA is seeking funding for the second phase, which involves testing two of the detector concepts at the FHWA’s Turner Fairbank Research Center.

In addition, the FHWA Office of Safety is funding a project with the NCUTLO to develop a model law on grade crossing safety. The NCUTLO plans to conduct research to determine which current State laws are effective and why and to set up a task force charged with formulating a model law.

Analysis

General

Although accidents involving oversize/overweight vehicles and loads happen infrequently, this accident and others investigated by the Safety Board demonstrate that when they occur, such accidents can cause extensive damage to the infrastructure and, particularly at highway-rail grade crossings, have the potential for catastrophic consequences.

This accident was similar to the November 30, 1993, Intercession City accident. Both accidents involved oversize/overweight loads, and both occurred during a construction phase at the Cane Island Power Park owned and operated by the KUA and the Florida Municipal Power Agency. In neither instance was the CSXT railroad notified to arrange safe passage for the long and slow-moving vehicles.

In the following analysis, the Safety Board will exclude those factors that did not cause or contribute to the accident, identify the factors that led to the accident, and determine which factors were contributory. This analysis will also address the status of past Safety Board recommendations regarding low-clearance or slow-moving vehicles at highway-rail grade crossings. Discussion will focus specifically on the movement of this oversize load, including the actions of the power company, its contractors, and subcontractors; the FLDOT; the motor carrier; the truckdriver; and pilot car drivers. It will also focus on the adequacy of the railroad notification requirement, the consistency and availability of information regarding railroad notification, and the configuration of the accident crossing. Finally, the analysis will consider measures that can be taken to prevent similar accidents.

Exclusions

The Amtrak crew was qualified to perform their duties in accordance with operating rules and hours-of-service requirements. The truckdriver had a valid CDL and medical certification. His postaccident toxicological tests were negative for alcohol and drugs, although the delay in testing limited the usefulness of the results for alcohol. However, no evidence indicated that the truckdriver was impaired.

The highway-rail grade crossing active warning devices functioned as designed. Postaccident mechanical inspections of the combination vehicle and the train revealed no defects or deficiencies. The Safety Board concludes that neither the design nor the operation of the active rail grade crossing warning devices nor the mechanical condition of the truck or the train contributed to the cause of this accident.

The engineer of the train initiated the standard emergency tone 9 radio procedure to contact the CSXT train dispatcher after the train came to a stop and shortly after the engineer had communicated with the conductor. The train dispatcher contacted the CSXT Police Communications Center, which contacted the local emergency services without delay. The Osceola County emergency services responded quickly and with sufficient personnel and equipment. Therefore, the Safety Board concludes that the CSXT emergency notification procedures were adequate and effective in alerting local emergency services, that the train crew's actions after the collision were consistent with the best efforts to summon emergency assistance, and that the emergency response was adequate and timely.

The Accident

This accident was very similar to the 1993 accident at the same location. Although the motor carrier was different, the KUA was not only the owner of the crossing and the receiver of both loads, it also had representatives at the crossing during both collisions. Additionally, no one contacted the railroad in either accident to determine whether it was safe to cross the tracks.

In 1993, the Amtrak train hit the truck near the center of its load, and as a result, the locomotive and three railcars were damaged extensively, 59 people were injured, and damages exceeded \$14 million. In 2000, by contrast, the Amtrak train hit the rear of the combination vehicle at the pusher truck. The train essentially pushed the truck and its 82-ton load out of the way, and the train remained upright and on the tracks. However, had the truck started to cross the tracks several seconds later or the train arrived several seconds sooner, the collision may have occurred near the center of the 82-ton load, and the consequences could have been quite different.

In this accident, due to the intersection's proximity to the crossing and the elevated configuration of the vehicle, the maximum speed the vehicle could maintain near the crossing was between 1 and 3 mph. Based on this speed, the minimum time the vehicle would occupy the crossing was between 57 seconds and 2 minutes 50 seconds. Active railroad grade crossing devices are required to provide a minimum of 20 seconds of warning time to motorists before the arrival of a train, and typically these devices provide between 20 and 25 seconds of warning. The warning devices at this crossing provided a warning time of 25 seconds. Thus, the accident truck required at least two and as much as seven times more warning of an approaching train than the active warning devices provided, effectively neutralizing the active warning devices.

Additionally, although the train engineer applied the brakes prior to actually identifying the truck on the crossing, he had no opportunity to avoid the collision. His brake application and throttle reduction during the approximately 16 seconds before the accident reduced the train speed by 19 mph, delaying his arrival at the crossing by about 1.73 seconds. While the train's reduced speed and slightly delayed arrival at the crossing may have altered the collision dynamics, there was still not enough time to avoid the

collision. The truck would have needed an additional 3.4 seconds to 10.25 seconds to clear the tracks.

The vehicle created a hazard at this crossing, since it occupied the tracks well beyond the standard minimum warning time provided for a vehicle to cross safely. The only prudent way to minimize the risk was to notify the railroad sufficiently in advance of crossing to ensure that train traffic was stopped or not present at the time the vehicle traversed the tracks. The Board concludes that neither the KUA, nor its contractors, nor the motor carrier properly considered the risks of crossing the tracks without first notifying the railroad to arrange safe passage.

Past Safety Board Recommendations Regarding Low-Clearance or Slow-Moving Vehicles at Highway-Rail Grade Crossings

In addition to the two accidents that occurred at the same highway-rail grade crossing in Intercession City on November 30, 1993,³² and November 17, 2000, the Safety Board has investigated five other accidents at highway-rail grade crossings involving four low-clearance or slow-moving vehicles (Sycamore, South Carolina;³³ Glendale, California;³⁴ Sumner, Washington;³⁵ and Milford, Connecticut³⁶) and a long combination vehicle (Portage, Indiana³⁷) and published a safety study³⁸ on passive grade crossings.

During these accident investigations, the Safety Board discovered that few of the participants involved were aware of the hazards associated with maneuvering oversize/overweight, low-clearance, slow-moving vehicles over highway-rail grade crossings or of the need or a requirement to notify the railroad before attempting such maneuvers.

³² NTSB/HAR-95/01.

³³ National Transportation Safety Board, *Highway-Rail Grade Crossing Collision Near Sycamore, South Carolina, May 2, 1995*, Highway Accident Report NTSB/HAR-96/01 (Washington, DC: NTSB, 1996).

³⁴ National Transportation Safety Board, *Collision Between Metrolink Train 901 and Mercury Transportation, Inc., Tractor-Combination Vehicle at Highway-Railroad Grade Crossing in Glendale, California, January 28, 2000*, Highway Accident Report, NTSB/HAR-01/02 (Washington, DC: NTSB, 2001).

³⁵ On December 23, 2000, a truck, towing a house, had stopped on the tracks to adjust tow dollies when it was struck by an Amtrak train. The load was being escorted by a pilot car and three uniformed, off-duty county police officers. No permit had been obtained to cross the tracks. (National Transportation Safety Board Docket No. Highway-01-IH013).

³⁶ On October 3, 1995, a low-bed semitrailer, transporting an excavator, was struck by a commuter train after becoming lodged on the railroad tracks; the truckdriver attempted to raise the semitrailer for 3 or 4 minutes before the train arrived. No one contacted the railroad before attempting to cross the tracks or after the accident. (National Transportation Safety Board Docket No. Highway-SRH-96-MH001).

³⁷ National Transportation Safety Board, *Collision of Northern Indiana Commuter Transportation District Train 102 With a Tractor-Trailer, Portage, Indiana, June 18, 1998*, Railroad Accident Report, NTSB/RAR-99/03 (Washington, DC: NTSB, 1999).

³⁸ National Transportation Safety Board, *Safety at Passive Grade Crossings*, Safety Study NTSB/SS-98/03 (Washington, DC: NTSB, 1998).

Intercession City, Florida—November 30, 1993

The Safety Board issued several recommendations³⁹ as a result of its investigation. The Board asked AASHTO to encourage the States to review and revise permitting procedures for oversize vehicles crossing highway-rail grade crossings, and the Board urged organizations representing the trucking and railroad industries to educate operators of low-clearance, oversize vehicles about the need to notify the railroad before attempting to traverse a highway-rail grade crossing. In response, AASHTO sent copies of the Safety Board's accident report to its members, urging them to review these permit procedures and take corrective action. Also in response to these recommendations, industry launched a number of efforts to educate truckdrivers, including the following:

The SC&RA distributed an Operation Lifesaver, Inc., (OLI) video on grade crossing safety at its March 1996 Oversize/Overweight Symposium, had Safety Board representatives speak at its October 1996 Safety Forum, and produced a permit manual including State-by-State permit regulations and specific requirements at highway-rail grade crossings.

The Association of American Railroads (AAR) disseminated information about the accident and asked its members to review their procedures for coordinating the transit of oversize shipments across their rights of way.

The American Short Line and Regional Railroad Association (ASLRRA) informed its members of the accident via a direct mailing and requested that they review their practices regarding coordinating oversize loads.

The CSXT railroad revised its permit form to include a 24-hour emergency number.

In addition, the Safety Board issued the following safety recommendation to the NCUTLO:

H-95-12

Revise Section 14-112, "Permits for Excess and Weight," of the *Uniform Vehicle Code* to require that State agencies notify carriers of the provisions contained in Section 11-703, "Moving Heavy Equipment at Railroad Grade Crossings," before issuing permits.

To monitor the implementation of this recommendation, the Safety Board sent letters dated May 5, 1996, and November 6, 2001, to the NCUTLO requesting a reply. Recent discussions with NCUTLO staff indicate that the FHWA has approved funding for development of a model law for railroad crossing safety. The model law will address issues related to the movement of heavy equipment at railroad crossings, and the Board urges the NCUTLO to proceed without delay on this important safety issue. Pending

³⁹ Safety Recommendations H-95-07 through -09, -12, -24, -26, and -30. See appendix B for more information on these and related recommendations.

further response, the Safety Board classifies Safety Recommendation H-95-12 “Open—Acceptable Alternate Response.”

Passive Grade Crossing Safety Study—1998

More than 4,000 accidents occurred at the Nation’s active and passive grade crossings each year from 1991 through 1996; 54 percent of the accidents and 60 percent of the fatalities were at passive grade crossings, where drivers are not provided warning by train-activated devices. The Safety Board conducted this study to identify common causes for accidents at passive crossings and to identify remedies to improve safety at passive crossings that are not scheduled for closure or upgrade. As a result of its study, the Safety Board recommended that the States determine within 2 years, in conjunction with U.S. Department of Transportation, governmental oversight responsibility for safety at private highway-rail grade crossings and ensure that traffic control on these crossings meets the standards within the MUTCD.⁴⁰ Florida responded that although it did not currently have jurisdiction over private crossings, it would consider a legislative initiative to obtain the authority. The State has not done so to date.

Portage, Indiana—June 18, 1998

In this accident, a two-car passenger train struck the second semitrailer of a long combination vehicle consisting of a tractor pulling two flatbed semitrailers loaded with steel coils at a highway-rail grade crossing. Three fatalities and five minor injuries resulted. Estimated damages were \$886,000. The investigation revealed that action by Federal, State, and private agencies had been ineffective in permanently resolving safety problems at the grade crossing. As a result of its investigation, the Safety Board recommended that the Federal Government eliminate any differentiations between private and public highway-rail grade crossings with regard to providing funding for, or requiring the implementation of, safety improvements.⁴¹ The FHWA proposed adding language to the MUTCD to define private highway-rail grade crossings.

Sycamore, South Carolina—May 2, 1995

In this accident, a low-clearance vehicle became lodged on railroad tracks and was struck by an Amtrak passenger train, resulting in 33 injuries and over \$1 million in damages. Investigators determined that the driver had failed to contact the authorities after becoming stuck. The Safety Board’s recommendations⁴² focused on educating truckdrivers regarding the hazards of humped crossings. In response to these recommendations, industry launched additional efforts to educate truckdrivers, including the following:

⁴⁰ Safety Recommendation H-98-35. See appendix B for more information on this and related recommendations.

⁴¹ Safety Recommendation I-99-02. See appendix B for more information on this and related recommendations.

⁴² Safety Recommendations H-96-08 and -09. See appendix B for more information on these and related recommendations.

The American Trucking Associations disseminated information about the accident to its members through its weekly newsletter, *Transport Topics*, and developed a *Physics 101* video to educate drivers on grade crossing safety, specifically on the hazards of driving low-clearance vehicles over grade crossings.

The OLI developed an information program, including a brochure and video on grade crossing safety, for truckdrivers not covered by other groups.

Glendale, California—January 28, 2000

This accident, in which a tractor-combination vehicle became lodged on railroad tracks and was subsequently struck by a westbound Metrolink commuter train, revealed the importance of educating not only truckdrivers, but also pilot car drivers and police escort personnel, on the safe movement of low-clearance and oversize/overweight vehicles over highway-rail grade crossings. In addition, the investigation revealed that information concerning oversize vehicle movement is fragmented, with guidance spread among the States and AASHTO. Consequently, the Safety Board recommended on December 20, 2001, that the FHWA, in cooperation with the FMCSA and trucking industry associations, develop a model pilot car training program and model oversize/overweight vehicle movement guidelines.⁴³ In addition, the Safety Board recommended that law enforcement and trucking industry associations alert their members of the hazards of moving oversize/overweight vehicles over grade crossings, emphasizing the need for railroad notification.⁴⁴

Movement of the Oversize/Overweight Load

Despite industry's education and training efforts since 1993, awareness of the hazards of maneuvering oversize/overweight vehicles at grade crossings and the consequent need to notify railroads is still lacking. For instance, the Safety Board discovered during its investigation of the November 17, 2000, Intercession City accident, the second one at this site, that prior to the accident, neither the shippers, nor the motor carrier, nor the receivers notified the CSXT of the oversize/overweight load traversing its tracks. Furthermore, the lack of clarity in the Florida permit process allowed the motor carrier, pilot car drivers, and truckdriver to plausibly argue that they were not aware of the need to notify the railroad.

To better understand why those involved with the movement of this oversize/overweight load did not notify the railroad and request safe passage at this

⁴³ Safety Recommendations H-01-30 and -31. See appendix B for more information on these and related recommendations.

⁴⁴ Safety Recommendations H-01-36 and -37. See appendix B for more information on these and related recommendations.

crossing, the Safety Board examined the roles and responsibilities of those involved in planning and executing the movement of this oversized load.

Shipper and Receivers

KUA contracted with Black & Veatch to serve as architect-engineer and construction manager for both the 1993 and 2000 construction projects. Although KUA officials claimed to be aware of the hazards of low-clearance, slow-moving vehicles at this crossing since the November 30, 1993, accident, the Safety Board could not identify changes to their procedures to accommodate the special needs of these movements. Since the KUA Power Road crossing is a private crossing and the only oversized/overweight vehicles that traverse this crossing are those making deliveries during a KUA construction phase, KUA and its construction contractors and subcontractors have a responsibility for ensuring safety at this highway-rail grade crossing. Moreover, because of the 1993 accident, all these participants should have been acutely aware of the potential risk at this grade crossing and should have ensured that the railroad was notified.

The condenser involved in the November 17, 2000, accident was built by Mark Steel (Salt Lake City) and installed in Kissimmee by TEi, which hired Molnar to haul the condenser from Salt Lake City to the construction site. According to KUA, all carriers were supposed to be advised to notify the railroad before moving oversized loads over the railroad crossing, although this requirement was not specified in writing. Safety Board investigators found that TEi and Molnar disagreed with one another about whether they exchanged information on railroad notification requirements. The railroad was not notified, and safe passage was not provided.

Obtaining transit times from the railroad is insufficient. In the 1993 Intercession City accident, the truckdriver stated that a KUA or Black & Veatch employee advised the truck crew to hurry because they could expect a train at a certain time; therefore, the truckdriver believed that KUA was in contact with the railroad. KUA denied that such a conversation occurred. Because these large, low-clearance, slow-moving vehicles require so much time to clear grade crossings and have the potential to bottom out or get stuck, it is imperative that the railroad control train traffic on the track until these vehicles are clear. To do this, the railroad has to be aware that a low-clearance, slow-moving vehicle needs to cross its track.

KUA and its contractor should know when they are to take delivery of a load and should ensure that the railroad is notified. They could accomplish the latter by terms of their contracts and by erecting signs in advance of the crossing that advise low-clearance or slow-moving vehicle operators to notify the railroad before traversing the tracks. Therefore, the Safety Board believes that KUA should require that the CSXT railroad is notified in advance of accepting delivery by any low-clearance or slow-moving vehicles.

Motor Carrier

In this accident, the motor carrier arranged for 8 of the 10 permits directly with the States. The carrier reported receiving the Florida permit with only the statement that the

“movement shall be in compliance with W/FS 316.08, 316.170, and F.A.C. rule 14-26.” According to the Molnar Safety Director, the carrier made several attempts to determine the text of these sections. In addition, before the convoy entered Florida, the carrier indicated that it called the private permit service it used and asked the service to define the text of the citations. The permit service told Molnar that FSSs 316.08 and 316.170 pertained to the carrier “giving truthful information about the load dimensions and description.” As noted previously, the lack of clarity in the Florida permit received by Molnar would have necessitated additional research to determine the conditions of the permit.

Florida Department of Transportation

After the November 30, 1993, accident at this location, the FLDOT developed a brochure explaining the railroad notification requirements in FSS 316.170 and procedures for contacting the railroads that operate in Florida. However, the brochure is out of print and unavailable for distribution. After the first accident, the FLDOT also added a line on the permit that referenced the statute citation, but did not explain what it meant. As a result, the lack of clarity in the permit allowed Molnar and others to plausibly maintain that they were unaware of the railroad notification requirements. Even though the KUA crossing was a private crossing and may not have been covered by the statute, neither a motor carrier nor a truckdriver is likely to have recognized that it was a private crossing. Therefore, information regarding railroad notification printed on the permit may have alerted Molnar about the need to notify the railroad to arrange safe passage. The Safety Board concludes that had the FLDOT included language on the permit explaining that low-clearance, slow-moving vehicles are required to notify the railroad before crossing, this accident might have been avoided.

After the November 17, 2000, accident, the Florida permit office distributed a one-page document with the text of FSSs 316.170 and 316.550 to the private permit companies that do business with the State. The permit office includes this document with all permits issued.

As noted above, when Molnar called the FLDOT permit office, it was unsuccessful in determining the text of the statute. When the convoy interacted with the FLDOT Office of Motor Carrier Compliance Weight Enforcement Program officers near the Florida-Georgia border, they were advised that they needed an additional Florida-certified pilot car driver. (One of the two pilot car drivers escorting the load did not have a Florida certification.) But Florida officials did not discuss the meaning of FSS 316.170 with the convoy. During the interaction with the FLDOT permit office and with officers from the Office of Motor Carrier Compliance Weight Enforcement Program at the Florida-Georgia border, Florida officials lost an opportunity for communication regarding the railroad notification requirements.

Truckdriver Training

The truckdriver told Safety Board investigators that he was not aware that any States had requirements to notify the railroad before crossing its tracks. He was also

unaware of the minimum warning times at railroad grade crossings or how the warning devices operated. In addition, he stated that he did not see the emergency signs with the CSXT 1-800 number posted at the crossing. Since the carrier did not have a formal training program, the truckdriver received no specific training on the hazards of long, slow-moving vehicles at grade crossings. Although the truckdriver may have been exposed to some information regarding grade crossing safety through the CDL program, the CDL tests do not specifically address the operation of grade crossing warning devices and the hazards of long, slow-moving vehicles at grade crossings.

As discussed earlier, the Safety Board has addressed the issue of training truckdrivers about the hazards of railroad crossings in previous safety recommendations. The Board has been advised that units of the FRA and the FMCSA are working together to develop a training module on the dangers of grade crossings and the new FMCSA regulations, which take effect in October 2002, setting CDL disqualification penalties for highway-rail grade crossing violations. The development of such a module is commendable.

Railroad Notification

CSXT railroad charges an operator \$350 to provide safe passage at a grade crossing. The penalty in Florida for failing to notify the railroad, when required, is \$60. Thus, the CSXT fee for providing safe passage across a crossing far exceeds the Florida penalty for failing to notify the railroad. This situation does not provide an incentive to encourage operators of slow-moving, low-clearance vehicles to notify the railroad. Yet the prevention of railroad grade crossing collisions is in everyone's best interest. To promote more notifications by operators of slow-moving, low-clearance vehicles of their intent to traverse highway-rail grade crossings, the CSXT should eliminate the \$350 fee for safe passage across crossings.

The CDL disqualification and the penalties for highway-rail grade crossing violations that take effect in October 2002 should promote railroad grade crossing safety. However, these actions do not address the issue of railroad notification. Therefore, the Safety Board believes that the FMCSA should amend CFR 383.51 (e), "Disqualification for railroad-highway grade crossing violation," to include a violation for drivers of low-clearance or slow-moving vehicles who fail to make arrangements with the railroad for safe passage, when required.

Pilot Car Drivers

None of the three certified pilot car drivers accompanying this load indicated that they were aware of the Florida law requiring certain oversize/overweight vehicles to notify the railroad before crossing a highway-rail grade crossing. Two of the three were Florida-certified. In its investigation of the Glendale accident,⁴⁵ the Safety Board determined that neither the Florida pilot car certification materials nor the other States that

⁴⁵ NTSB/HAR-01/02.

have certification programs address the need or requirement for certain vehicles (low-clearance or slow-moving or both) to notify the railroad before traversing grade crossings.

In Safety Recommendation H-01-30, issued in the Glendale report,⁴⁶ the Safety Board urged the FHWA to develop a model pilot car driver training program. The training program should address, at a minimum, issues such as (1) how to conduct route surveys; (2) the maneuvering limitations of heavy-haul vehicles; (3) the effects of fatigue on performance; (4) the need to assess the dangers at railroad crossings, particularly for low-clearance vehicles; and (5) the need and requirements to notify the railroads before an oversize/overweight vehicle is escorted across a highway-rail grade crossing. In the interim, those States that already have a pilot car certification program could include information about railroad notification in their programs. Colorado, Florida, Kansas, New York, Oklahoma, Utah, Virginia, and Washington have such programs, and Indiana and North Carolina have pilot car certification programs under development. Although the Safety Board has received no official response from the FHWA to Safety Recommendation H-01-30, the Board understands that the FHWA and others are developing a model pilot car certification program.

Adequacy of *Uniform Vehicle Code* Railroad Notification Requirement

Uniform Vehicle Code 11-703 and FSS 316.170 specify that if a vehicle traversing a grade crossing has a normal operating speed of 10 mph or less or a ground clearance of ½-inch-per-foot of the distance between any two axles, or a ground clearance of less than 9 inches, the operator of that vehicle must notify the railroad before crossing. The truckdriver indicated that the normal operating speed of the accident vehicle exceeded 10 mph. Safety Board investigators examined the accident vehicle at the scene; applying the formula provided in FSS 316.170 to this vehicle (1/2 inch per foot times 52 feet), the critical ground clearance was 26 inches. The accident vehicle's cargo bed could be raised to 32 inches. It is not clear that the accident vehicle would have met the definition for a vehicle required to notify the railroad in advance of crossing its tracks as found in the *Uniform Vehicle Code* and the Florida statute. However, due to the time this vehicle occupied the crossing, it clearly created a hazard.

Uniform Vehicle Code, Section 11-703, and the various State laws that are modeled after it do not cover the situation found in this accident, in which the proximity of an intersection to a grade crossing limits vehicle speed to less than 10 mph. The Safety Board has investigated several accidents⁴⁷ involving transporters of oversize loads whose normal operating speed was greater than 10 mph, but, due to the proximity of intersections, had to reduce their speed through the turn and over the grade crossing. In addition, unless a low-clearance vehicle stops well in advance of a crossing to raise the cargo deck to clear the

⁴⁶ NTSB/HAR-01/02.

⁴⁷ Intercession City, Florida (1993); Glendale, California; and Sumner, Washington.

crossing, it cannot reach highway speed. The relevant speed is the actual speed over the crossing. The Safety Board concludes that the definition of a vehicle required to notify the railroad of its intention to cross a highway-rail grade crossing found in the FSS 316.170 and *Uniform Vehicle Code*, Section 11-703, is inadequate because it is based on normal operating speed rather than the actual speed over the crossing.

The NCUTLO maintains the *Uniform Vehicle Code*. The FHWA Office of Safety currently has a contract with the NCUTLO to develop a model law on grade crossing safety, and the FHWA Office of Freight Management and Operations provides limited Federal oversight on the transportation of oversize/overweight loads. Therefore, the Safety Board believes that the FHWA and the NCUTLO should revise *Uniform Vehicle Code*, Section 11-703, to define which vehicles, under what circumstances, need to notify the railroad before crossing a highway-rail grade crossing. The SC&RA represents the heavy-hauling or oversize/overweight industry, and the Truck Trailer Manufacturers Association has knowledge of the operating characteristics of the specialized trailers used in the heavy-hauling industry. The Safety Board encourages the FHWA and the NCUTLO to work with the FRA, FMCSA, AASHTO, SC&RA, Truck Trailer Manufacturers Association, ASLRRRA, and representatives from all class 1 and regional railroads to meet the intent of this recommendation.

Adequacy and Consistency of Railroad Notification Requirements and Information

The need to notify the railroad to obtain safe passage at a given highway-rail grade crossing should be evaluated individually for each at-risk vehicle. The evaluation should take into account the compatibility of the crossing configuration, including approach and departure grades, and the proximity to turns, as well as the vehicle configuration, including ground clearance, axle spacing, overall length, and vehicle speed.

The data needed to perform this evaluation are currently found in different places and are not readily available to all participants in the process. The States should have the public crossing configuration information, although the approach and departure grade records may not be current. Many States require a route survey only when the vehicle and load exceed a certain height. Yet route surveys are important to an evaluation of the need to notify the railroad before crossing and should routinely be part of this process. The AAR/FRA Grade Crossing Inventory is available on the Internet. Although the inventory provides information about the proximity of an intersection, it does not include approach and departure grades or whether the crossing is humped. In addition, vehicle operators may not be aware the inventory exists.

The vehicle operator should know the configuration of the vehicle. Most States do not collect information about ground clearance or operating speed as part of the permit application process. The only point in the process at which all information becomes readily available is when the vehicle is at the crossing. Even then, the operator can notify the railroad only if an emergency number is posted at the crossing and if telephone access

is available. Arrangements for a given railroad to protect the crossing take time (in the case of CSXT, 2 weeks) and, generally, space to safely park the vehicle is not available.

The notification process should be consistent and user-friendly for all participants. The vehicle operator needs to know when it is necessary to notify the railroad, which railroad to notify, and how to do so. Currently, the sources of information about railroad notification requirements provide inconsistent guidance. In 24 of 34 States that have such requirements, the person contacted in the State permitting office did not know the State had railroad notification requirements. In addition, the data in the two published resources are not consistent with State statutes. Thus, the likelihood that a State will make the vehicle operator aware of the requirement is not great. Even if vehicle operators are aware of the State notification requirement, they are not told which railroad to notify. The Safety Board concludes that accurate and complete information pertaining to the requirement for low-clearance or slow-moving vehicles to notify the railroad prior to traversing grade crossings is lacking. The Safety Board, considers that once the *Uniform Vehicle Code* has been revised, the States should adopt the revised *Uniform Vehicle Code*, Section 11-703, and require operators of low-clearance and slow-moving vehicles to conduct route surveys. The AASHTO Highway Subcommittee on Highway Transport is concerned with the relationship between commercial vehicle operations and the Nation's highway systems, and this AASHTO subcommittee deals with permitting issues. Therefore, the Safety Board believes that AASHTO should encourage the States, once the *Uniform Vehicle Code* has been revised, to adopt the revised *Uniform Vehicle Code*, Section 11-703, and require operators of low-clearance and slow-moving vehicles to conduct route surveys. To avoid problems in determining the text of State railroad notification requirements, the States should include the text of the revised *Uniform Vehicle Code*, Section 11-703, on the face of permits. Therefore, the Safety Board believes that AASHTO should encourage the States to include the text of the revised *Uniform Vehicle Code*, Section 11-703, on the face of permits.

As demonstrated earlier, government officials missed several opportunities to inform the carrier of the railroad notification requirement, and the carrier found it difficult to discover the requirements on its own. Critical information, such as railroad notification requirements, should be easily available, frequently advertised, and regularly provided to motor carriers needing the information. Consequently, State employees who interface with the heavy-hauling industry should be knowledgeable about the State's railroad notification requirements. Therefore, the Safety Board believes that AASHTO should encourage the States to conduct initial and recurrent training for State employees in the permit offices and State employees involved in commercial vehicle enforcement regarding the railroad notification requirements.

The AAR/FRA Grade Crossing Inventory lists the railroad that controls a track if the vehicle operator can identify the crossing by location or knows the crossing number and is familiar with the FRA Web site inventory. In addition, most railroad Web sites publish the track routes. But once a vehicle operator knows which railroad to notify, finding the correct person to contact can be difficult. Various pages of the CSX Corporation Web site include the 1-800 emergency telephone number, and information

about grade crossing safety and a link to OLI is also available. However, investigators found no one source that listed all essential steps that operators of low-clearance or slow-moving vehicles must take to ensure safety and no railroad contact information for the arrangement of crossing safety. Investigators examined the Web sites of the other major railroads with similar results. The Safety Board concludes that safety would be enhanced if the CSXT and other railroads publicized contact information, via the Internet or other means, for those who need to arrange protection at grade crossings. Therefore, the Safety Board believes that all class 1 and regional railroads should provide easily accessed contact and notification information for use by vehicle operators requiring railroad assistance to ensure safety at grade crossings.

Safety of Accident Crossing

Although the combination vehicle did not get stuck or hang up on the crossing, the physical evidence and witness statements indicated that the vehicle did scrape the roadway on the departure grade. According to the 2001 AASHTO guidelines, the roadway surface should not be more than 3 inches higher or lower than the top of the nearest rail at a point 30 feet from the rail, unless track superelevation makes a different level appropriate. At a point 30 feet from the rail, the north approach was 6.84 inches below the plane of the superelevation extension. Therefore, the Safety Board concludes that under current AASHTO guidelines, the north approach makes the KUA Power Road crossing a humped crossing.

Although the presence of slow-moving, oversize/overweight trucks appears to be related to construction cycles at the plant, the possibility that other low-clearance delivery trucks will traverse this crossing still exists. Truckdrivers should be warned that it is a humped crossing. Therefore, the Safety Board believes that the KUA should install low-clearance highway-rail grade crossing signs (W10-5s) at the KUA Power Road crossing.

When the CSXT installed the emergency 1-800 number signs at the crossing in 1997, MUTCD standards for such signs did not exist. As a result, the existing signs are 12 by 6 inches and do not conform to the size criteria (29.5 by 29.5 inches and 17.7 by 29.5 inches) of the MUTCD standard signs. To ensure visibility in emergencies, the CSXT should upgrade the existing nonstandard emergency 1-800 number signs with the MUTCD standard I-13 or I-13a signs as the railroad makes improvements to crossings on its track system.

Conclusions

Findings

1. Neither the design nor the operation of the active rail grade crossing warning devices nor the mechanical condition of the truck or the train contributed to the cause of this accident.
2. The CSX Transportation, Inc., emergency notification procedures were adequate and effective in alerting local emergency services; the train crew's actions after the collision were consistent with the best efforts to summon emergency assistance; and the emergency response was adequate and timely.
3. Neither the Kissimmee Utility Authority, nor its contractors, nor the motor carrier properly considered the risks of crossing the tracks without first notifying the railroad to arrange safe passage.
4. Had the Florida Department of Transportation included language on the permit explaining that low-clearance, slow-moving vehicles are required to notify the railroad before crossing, the November 17, 2000, accident might have been avoided.
5. The definition of a vehicle required to notify the railroad of its intention to cross a highway-rail grade crossing found in the Florida State Statute 316.170 and *Uniform Vehicle Code*, Section 11-703, is inadequate because it is based on normal operating speed rather than actual speed over the crossing.
6. Accurate and complete information pertaining to the requirement for low-clearance or slow-moving vehicles to notify the railroad prior to traversing grade crossings is lacking.
7. Safety would be enhanced if the CSX Transportation, Inc., and other railroads publicized contact information, via the Internet or other means, for those who need to arrange protection at grade crossings.
8. Under the current American Association of State Highway Transportation Officials guidelines, the north approach makes the KUA Power Road crossing a humped crossing.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the November 2000 collision of Amtrak train 97 with the tractor-combination vehicle was the failure of the Kissimmee Utility Authority, its construction contractors and subcontractors, and the motor carrier to provide for the safe passage of the load over the grade crossing.

Recommendations

As a result of this accident, the National Transportation Safety Board makes the following safety recommendations:

New Recommendations

To the Federal Highway Administration and the National Committee on Uniform Traffic Laws & Ordinances:

Revise *Uniform Vehicle Code*, Section 11-703, to define which vehicles, under what circumstances, need to notify the railroad before crossing a highway-rail grade crossing. (H-02-07)

To the Federal Motor Carrier Safety Administration:

Amend the *Code of Federal Regulations* 383.51 (e), “Disqualification for railroad-highway grade crossing violation,” to include a violation for drivers of low-clearance or slow-moving vehicles who fail to notify and make arrangements with the railroad for safe passage, when required. (H-02-08)

To the American Association of State Highway and Transportation Officials:

Encourage the States, once the *Uniform Vehicle Code*, Section 11-703, has been revised, (a) to adopt the revised *Uniform Vehicle Code*, Section 11-703, (b) to include vehicle ground clearance as part of the permitting process, and (c) to require permitted slow-moving vehicles and those permitted vehicles that do not meet the ground-clearance provisions of the *Uniform Vehicle Code* to conduct route surveys. (H-02-09)

Encourage the States, once the revised *Uniform Vehicle Code*, Section 11-703, has been adopted, to include the text of the revised State statute on the face of permits. (H-02-10)

Encourage the States to conduct initial and recurrent training for State employees in the permit offices and State employees involved in commercial vehicle enforcement regarding the railroad notification requirements. (H-02-11)

To all Class 1 and Regional Railroads:

Provide easily accessed contact and notification information for use by vehicle operators requiring railroad assistance to ensure safety at grade crossings. (H-02-12)

To the Kissimmee Utility Authority:

Require that the CSX Transportation, Inc., railroad is notified in advance of accepting delivery by any low-clearance or slow-moving vehicles. (H-02-13)

Install low-clearance highway-rail grade crossing signs (W10-5s) at the KUA Power Road crossing. (H-02-14)

Previously Issued Recommendation Classified in This Report

Safety Recommendation H-95-12⁴⁸ (previously classified “Open—Await Response”) is classified “Open—Acceptable Alternate Response.”

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

MARION C. BLAKEY
Chairman

JOHN A. HAMMERSCHMIDT
Member

CAROL J. CARMODY
Vice Chairman

JOHN J. GOGLIA
Member

GEORGE W. BLACK, JR.
Member

Adopted: July 23, 2002

⁴⁸ For the text of this recommendation, see page 38.

Appendix A

Investigation

The National Transportation Safety Board was notified of the Intercession City, Florida, accident on November 17, 2000. An investigative team was dispatched with members from the Gardena, California; the Atlanta, Georgia; and the Washington, D.C., offices. Groups were established to investigate the highway, vehicle, signal, and track factors and the railroad and motor carrier operations.

No parties were designated, no public hearing was held, and no depositions were taken.

Appendix B

Previous Recommendations Relating to Slow-Moving, Low-Clearance Vehicles at Highway-Rail Grade Crossings

Intercession City, Florida—November 30, 1993

A 184-foot-long vehicle loaded with an 82-ton turbine was stopped on a private crossing near Intercession City, Florida, while the crew was raising the height of the cargo deck, when an Amtrak train carrying 89 passengers struck the side of the cargo deck and the turbine.¹ Six people sustained serious injuries and 53 people suffered minor injuries. Damages exceeded \$14 million. The National Transportation Safety Board determined that the probable cause of this accident was the failure of Rountree Transport & Rigging, Inc., to notify CSXT² in advance of its intent to cross the railroad track and to ensure through CSXT that it was safe to do so. Contributing to the accident were deficiencies in the permitting processes of CSXT and the Florida Department of Transportation that resulted in a lack of appropriate guidance for permitting officials; oversize, low-clearance operators; and escort personnel.

As a result of the investigation of this accident, the Safety Board made the recommendations discussed below.

To the American Association of State Highway and Transportation Officials:

H-95-07

Inform your members of the facts and circumstances of the Intercession City, Florida, accident and urge that they require operators of low-clearance, overdimension/overweight vehicles to provide railroads with advance notification of travel over grade crossings. Further, recommend that these members revise their permit document to state that compliance with this notification requirement is a condition of permitting.

On April 30, 1996, after learning that the American Association of State Highway and Transportation Officials distributed copies of the accident report to its members, urging them to review their permit procedures and take corrective action, as necessary, the Safety Board classified Safety Recommendation H-95-07 “Closed—Acceptable Action.”

¹ National Transportation Safety Board, *Collision of Amtrak Train No. 88 with Rountree Transport and Rigging, Inc., Vehicle on CSX Transportation, Inc., Railroad Near Intercession City, Florida, November 30, 1993*, Highway Accident Report NTSB/HAR-95/01 (Washington, DC: NTSB, 1995).

² “CSXT” is a recognized abbreviation for CSX Transportation, Inc., which is a division of CSX Corporation. The railroad is commonly referred to as CSX.

To the Specialized Carriers & Rigging Association:H-95-08

Advise your members of the facts and circumstances of the Intercession City, Florida accident, and urge that they implement procedures to ensure that personnel coordinate with railroads when traversing grade crossings, comply with all statutes, obtain all necessary permits, have an emergency contingency plan, and outfit the move crew with appropriate emergency equipment, telephone numbers, and contacts.

H-95-09

Revise the Permit Manual of State Permits and Canadian Regulations to list those jurisdictions that require low-clearance vehicle operators to provide railroads with advance notification of intended travel over grade crossings and include a caution that coordinating with railroads is necessary to ensure safe travel over grade crossings.

The Specialized Carriers & Rigging Association (SC&RA) distributed an Operation Lifesaver video on railroad grade crossing safety at its 1996 Oversize/Overweight Symposium and had a representative from the Safety Board give a presentation on railroad grade crossing safety at its 1996 Safety Forum. On May 14, 1998, the Safety Board classified Safety Recommendation H-96-08 "Closed–Acceptable Action."

On May 14, 1998, after learning that the SC&RA had produced a railroad grade crossing permit guide, the Safety Board classified Safety Recommendation H-95-09 "Closed–Acceptable Action."

To the International Association of Chiefs of Police:H-95-10

Advise your members of the facts and circumstances of the Intercession City, Florida, accident and request that those whose activities include providing or overseeing overdimension vehicle escort review their policies and procedures to ensure the vehicle operator is in compliance with all applicable permit and advance notification requirements and has the communications capability and telephone numbers to contact railroad, utility, and other private entities along the route in the event of a change in plans or an emergency.

On November 3, 1995, after learning that the International Association of Chiefs of Police had notified all superintendents of State police and highway patrol organizations of the facts and circumstances of the accident and asked them to review their policies and procedures to ensure the vehicle operator is in compliance with all permit and notification procedures, the Safety Board classified Safety Recommendation H-95-10 "Closed–Acceptable Action."

To the National Sheriffs' Association:H-95-11

Advise your members of the facts and circumstances of the Intercession City, Florida, accident and request that those whose activities include providing or overseeing overdimension vehicle escort review their policies and procedures to ensure the vehicle operator is in compliance with all applicable permit and advance notification requirements and has the communications capability and telephone numbers to contact railroad, utility, and other private entities along the route in the event of a change in plans or an emergency.

On October 31, 2001, the National Sheriffs' Association advised the Safety Board that in February 2002, the subject recommendation will be presented to the Traffic Safety Committee. On December 26, 2001, the Safety Board classified Safety Recommendation H-95-11 "Open—Acceptable Response."

To the National Committee on Uniform Traffic Laws & Ordinances:H-95-12

Revise Section 14-112, "Permits for Excess Size & Weight," of the *Uniform Vehicle Code* to require that State agencies notify carriers of the provisions contained in Section 11-703, "Moving Heavy Equipment at Railroad Grade Crossings," before issuing permits.

This safety recommendation is classified "Open—Await Response."

To the Association of American Railroads:R-95-24

Inform your members of the facts and circumstances of the Intercession City, Florida, accident and recommend that they review their procedures for coordinating the transit of overdimension, low-clearance highway vehicles across their right-of-way.

On October 2, 1995, the Association of American Railroads advised the Safety Board that it had informed its members of the accident and asked that they review their procedures for coordinating the transit of overdimension, low-clearance vehicles across their right of way. On January 23, 1996, the Safety Board classified Safety Recommendation H-95-24 "Closed—Acceptable Action."

To the American Short Line Railroad Association:R-95-26

Inform your members of the facts and circumstances of the Intercession City, Florida, accident and recommend that they review their procedures for coordinating the transit of overdimension, low-clearance highway vehicles across their right of way.

On October 17, 1995, after learning that the American Short Line Railroad Association members had been informed of the accident by a direct mailing, including a request that members review their individual practices regarding coordinating over-dimension loads, the Safety Board classified Safety Recommendation R-95-26 “Closed–Acceptable Action.”

To the CSX Transportation Corporation:

H-95-30

Revise your permitting process and forms to ensure that overdimension vehicle operators provide load and complete route information so that CSX Transportation Corporation can ensure protection; ensure that CSX Transportation Corporation employees issuing permits are familiar with the process and include a staffed 24-hour CSX Transportation telephone number on the permit forms.

On April 7, 1997, after learning that the CSXT revised its form to include a 24-hour telephone number, the Safety Board classified Safety Recommendation R-95-30 “Closed–Acceptable Action.”

Sycamore, South Carolina—May 2, 1995

A low-clearance vehicle became lodged on the railroad tracks and was struck by an Amtrak passenger train, resulting in 33 injuries and over \$1 million in damages.³ As a result of its investigation, the Safety Board made the following recommendations:

To the U.S. Department of Transportation:

H-96-01

Amend the Department of Transportation/Association of American Railroads Grade Crossing Inventory database to include vertical profile information on all highway-rail grade crossings in the United States.

The U.S. Department of Transportation (DOT) advised the Safety Board in a February 10, 1997, letter that the Federal Railroad Administration (FRA) had contracted for modification of the Grade Crossing Inventory database to include the number of high-profile signs located at each crossing. According to the DOT, “zero would indicate that this is not a high-profile crossing (on the assumption that no road or railroad authority would identify a crossing as high-profile without taking appropriate action). Non-zero would indicate a high-profile crossing with appropriate signing.” The DOT further indicated that once modification to the database was complete, which was expected to occur by April 1997, the States and railroads would be instructed on the proper means to provide information to and access the modified database.

³ National Transportation Safety Board, *Highway-Rail Grade Crossing Collision Near Sycamore, South Carolina, May 2, 1995*, Highway Accident Report NTSB/HAR-96/01 (Washington, DC: NTSB, 1996).

The Safety Board classified Safety Recommendation H-96-01 “Open—Acceptable Response” on August 29, 1997. On that date, the Safety Board requested that the DOT consider including vertical profile data for each crossing in the Grade Crossing Inventory database. The Safety Board stated that it believed the inventory could be expanded in a cost-effective manner to include vertical profile data and measurements and that survey teams that currently collect State grade crossing data could easily be trained to make these measurements.

H-96-02

Encourage and coordinate efforts between the railroad industry and State and local highway transportation officials to identify substandard grade crossing profiles (hump crossings) and close or take appropriate corrective action to eliminate them.

H-96-03

Encourage States to post warning notices at hump crossings where high profiles present potential hazards for highway vehicles and where such hazardous profiles cannot be corrected in a timely manner.

On February 10, 1997, in response to Safety Recommendations H-96-02 and -03, the DOT indicated that the Technical Working Group of the Grade Crossing Safety Task Force would address how appropriate road authorities (State and local) could establish a systematic procedure for gathering and applying local knowledge of substandard-profile crossings. The DOT stated that once State and local highway agencies, working with railroads, identified crossings with substandard profiles by reviewing accident data and consulting with highway engineers, local railroad officials, truckers, and public officials, the State and local agencies would be encouraged either to post the appropriate signs or correct the problem. On August 29, 1997, having noted the DOT’s positive efforts in response to these recommendations, the Safety Board requested to be informed when action on these recommendations had been completed and classified Safety Recommendations H-96-02 and -03 “Open—Acceptable Action.”

H-96-04

Develop procedures and processes that will facilitate improved communication and coordination between the railroad industry and State and local highway transportation officials regarding crossing maintenance activities so as to prevent the creation of hump crossings.

On February 10, 1997, the DOT outlined several activities that would be undertaken to address this recommendation, including establishing focal points within the States that could ensure proper coordination between highway authorities and railroads and that would serve as a clearinghouse for the collection and dissemination of pertinent information on how to prevent the creation of high-profile crossings to State and local highway authorities and railroads. On August 29, 1997, the Safety Board asked that it be informed when these activities had been completed and classified Safety Recommendation H-96-04 “Open—Acceptable Action.”

To the Federal Highway Administration:H-96-05

Adopt the proposed changes that are published in the notice of proposed amendments to the *Manual on Uniform Traffic Control Devices* regarding warning signs for substandard vertical profiles at railroad grade crossings.

On September 5, 1997, the Federal Highway Administration advised the Safety Board that it had adopted the low-ground clearance warning highway-railroad grade crossing sign (W10-5). This sign, which has been incorporated into the *Manual on Uniform Traffic Control Devices* (MUTCD), is specifically designed to warn drivers of highway profile conditions sufficiently abrupt to create a “hang-up” situation for long wheelbase vehicles or low-ground clearance trailers. Subsequently, on January 2, 1998, the Safety Board classified Safety Recommendation H-96-05 “Closed–Acceptable Action.”

To the American Association of Motor Vehicle Administrators:H-96-06

Revise the *Commercial Driver’s License Manual* to include specific information on hump crossings and ensure that truckdrivers are tested on their knowledge of grade crossing safety, with special emphasis on hump crossings.

H-96-07

Revise the *Commercial Driver’s License Manual* to include information on grade crossing emergency notification procedures and ensure that truckdrivers are tested on their knowledge of these procedures.

In March 1996, the American Association of Motor Vehicle Administrators indicated that the recommendations had been referred to its Test Maintenance Subcommittee and would be placed on the agenda for the next meeting. In May 1996, the Safety Board asked for progress reports on the subcommittee’s efforts to meet the intent of the recommendation. In February 1998, the Safety Board inquired about the status of the subcommittee’s actions and, having received no response from the American Association of Motor Vehicle Administrators, in July 1998, classified Safety Recommendations H-96-06 and -07 “Closed–Unacceptable Action–No Response Received.”

To the American Trucking Associations, Inc.:H-96-08

Advise your membership of the circumstances of this accident and during in-service training for all drivers, highlight the potential hazards associated with moving low-bed trailers over hump grade crossings. Include specific instructions for notifying authorities when emergencies or hazardous conditions exist at grade crossings.

The American Trucking Associations, Inc., responded that information regarding the accident has been published in its weekly newspaper *Transport Topics* and that it developed the video *Physics 101*, which highlights general training on grade crossing safety and specific training on the hazards of low-bed vehicles over grade crossings. The Safety Board classified Safety Recommendation H-96-08 “Closed–Acceptable Action” on September 6, 1996.

To Operation Lifesaver, Inc.:

H-96-09

In conjunction with appropriate trucking industry groups, expand your existing programs to educate truckdrivers who are not exposed to industry programs on the hazards of hump grade crossings.

Operation Lifesaver, Inc., has created the brochure *Highway-Rail Grade Crossings* in which it has included the following text pertaining to grade crossings: “Do not get trapped on a highway-rail crossing. Never drive onto a railroad crossing until you are sure you can clear the tracks on the other side without stopping.” It has also created a training video that has a 10-minute video section and presents another 30 minutes of scheduled grade crossing information. Safety Recommendation H-96-09 has been classified “Closed–Acceptable Action.”

To the Class 1 Railroads:

R-96-03

Install signage for a 24-hour toll-free emergency telephone notification system for use by the public at all your highway-rail grade crossings.

CSXT advised the Safety Board that it had posted the 1-800 phone number at all its public crossings. On August 20, 2000, the Safety Board classified Safety Recommendation R-96-03 “Closed–Acceptable Action.”

Portage, Indiana—June 18, 1998

A two-car passenger train struck the second semitrailer of a long-combination vehicle loaded with steel coils at a highway-rail grade crossing near Portage, Indiana.⁴ When the vehicles collided, a steel coil, weighing about 19 tons, entered the train through the lead car’s front bulkhead and moved into the passenger compartment. Three fatalities and five minor injuries resulted and damages were estimated at \$886,000. The Safety Board determined the probable cause of the collision was ineffective action by Federal, State, and private agencies to permanently resolve safety problems at the grade crossing, which they knew to be hazardous.

⁴ National Transportation Safety Board, *Collision of Northern Indiana Commuter Transportation District Train 102 With a Tractor-trailer, Portage, Indiana, June 18, 1998*, Railroad Accident Report NTSB/RAR-99/03 (Washington, DC: NTSB, 1999).

To the U.S. Department of Transportation:I-99-02

Eliminate any differentiations between private and public highway-rail grade crossings with regard to providing funding for, or requiring the implementation of, safety improvements.

On May 8, 2000, the DOT advised the Safety Board that it proposed to amend the MUTCD by defining private highway-rail crossings, discussing issues related to private crossings, and adding a sign warning section. The Safety Board anticipates that with this language added to the MUTCD, differences between private and public highway-rail grade crossings will be eliminated. On August 16, 2000, the Safety Board classified Safety Recommendation I-99-02 “Open–Acceptable Response” pending receipt of the final rule amending the MUTCD.

1998 Passive Grade Crossing Safety Study

As part of the 1998 passive grade crossing study,⁵ the Safety Board made the recommendations discussed below.

To the Federal Railroad Administration:R-98-91

Modify the grade crossing inventory system to include information on (1) the sight distances available to a motorist, and (2) the presence of curves on the roadway and on the tracks. Direct the States to include these data as a part of the regularly scheduled updates of the database.

The FRA updated the grade crossing inventory database, and, therefore, the Safety Board classified Safety Recommendation R-98-41 “Closed–Acceptable Action” on January 4, 2000. However, subsequent Safety Board investigations revealed that some information in the inventory is still outdated and incorrect. The FRA informed the Safety Board that such discrepancies occur because updating the information is voluntary, and the FRA said that it lacks the authority to require States or railroads to upgrade inventory information. The FRA stated that it has encouraged the States to provide up-to-date information for the inventory, but the States have not done so.

To the 50 States:H-98-35

Determine within 2 years, in conjunction with the U.S. Department of Transportation, governmental oversight responsibility for safety at private highway-rail grade crossings and ensure that traffic control on these crossings meets the standards within the *Manual on Uniform Traffic Control Devices*.

⁵ National Transportation Safety Board, *Safety at Passive Grade Crossings*, Safety Study Report NTSB/SS-98/03 (Washington, DC: NTSB, 1998).

Florida stated in a June 7, 2000, letter that it did not have jurisdictional authority over private crossings. The Safety Board, in its October 16, 2000, response, encouraged Florida to introduce legislation to expand its authority to include private crossings. Because Florida responded in a November 9, 2000, letter that it will consider a legislative initiative to expand its highway-rail crossing authority when developing its legislative package next year, the Safety Board, on April 30, 2001, classified Safety Recommendation H-98-35 “Open–Acceptable Response” pending receipt of further information on the subject.

Glendale, California—January 28, 2000

On January 28, 2000, about 5:56 a.m. in Glendale, California, a tractor-combination vehicle missed a turn in its planned route, traversed a highway-rail grade crossing, turned around, and was attempting to retrace the crossing when it became lodged on the railroad tracks. About 90 seconds later, a commuter train collided with the vehicle. The engineer, conductor, and four passengers received minor injuries.⁶

The tractor-combination vehicle measured 135 feet long, 15 feet wide, and 18 feet 6 inches high, with a ground clearance of approximately 6 inches; the gross vehicle weight was 226,000 pounds. The load, valued at \$1.5 million, was being transported from Houston, Texas, to El Segundo, California, and possessed specialized moving permits requiring escort vehicles. At the time of the accident, two private pilot vehicles and three California Highway Patrol officers were escorting the tractor-combination vehicle.

The Safety Board determined that the probable cause of the collision of the passenger train with the tractor-combination vehicle was (1) inadequate preparation and route planning for the movement; (2) poor coordination of the movement among the truckdriver, pilot car drivers, police escort, and permitting authorities; and (3) a lack of recognition of the potential hazard caused by the accident vehicle at the grade crossing. Contributing to the accident was the fatigue of the pilot car drivers and the truckdriver.

As a result of its investigation, the Safety Board made the following safety recommendations:

To the Federal Highway Administration, in cooperation and consultation with the Federal Motor Carrier Safety Administration, the American Association of State Highway and Transportation Officials, the American Association of Motor Vehicle Administrators, the Commercial Vehicle Safety Alliance, the Specialized Carriers & Rigging Association, the California Professional Escort Car Association, the Texas Pilot Car Association, and the United Safety Car Association:

⁶ National Transportation Safety Board, *Collision Between Metrolink Train 901 and Mercury Transportation, Inc., Tractor-Combination Vehicle at Highway-Railroad Grade Crossing in Glendale, California*, January 28, 2000, Highway Accident Report HTSB/HAR-01/02 (Washington, DC: NTSB, 2001).

H-01-30

Develop a model pilot car driver training program. The training program should address, at a minimum, issues such as (1) how to conduct route surveys; (2) the maneuvering limitations of heavy-haul vehicles; (3) the effects of fatigue on performance; (4) the need to assess the dangers at railroad crossings, particularly for low-clearance vehicles; and (5) the need and requirements to notify the railroads before an oversize/overweight vehicle is escorted across a highway-rail grade crossing. (“Open—Await Response”)

H-01-31

Develop model oversize/overweight vehicle movement guidelines. The guidelines should address, at a minimum, issues such as (1) when pilot cars and police escorts are required; (2) the training, testing, and certification of pilot car operators, police officers, and truckdrivers in the movement of oversize/overweight loads; (3) the use of height poles and traffic controls; (4) how to conduct route surveys; (5) the maneuvering limitations of heavy-haul vehicles; (6) the effects of fatigue on performance; (7) the need to assess the dangers at railroad crossings, particularly for low-clearance vehicles; and (8) the need and requirements to notify the railroads before an oversize/overweight vehicle is escorted across a highway-rail grade crossing. (“Open—Await Response”)

To the Federal Motor Carrier Safety Administration, the American Association of State Highway and Transportation Officials, the American Association of Motor Vehicle Administrators, the Commercial Vehicle Safety Alliance, the Specialized Carriers & Rigging Association, the California Professional Escort Car Association, the Texas Pilot Car Association, and the United Safety Car Association:

H-01-32

Work with the Federal Highway Administration to develop a model pilot car driver training program. The training program should address, at a minimum, issues such as (1) how to conduct route surveys; (2) the maneuvering limitations of heavy-haul vehicles; (3) the effects of fatigue on performance; (4) the need to assess the dangers at railroad crossings, particularly for low-clearance vehicles; and (5) the need and requirements to notify the railroads before an oversize/overweight vehicle is escorted across a highway-rail grade crossing.

H-01-33

Work with the Federal Highway Administration to develop model oversize/overweight vehicle movement guidelines. The guidelines should address, at a minimum, issues such as (1) when pilot cars and police escorts are required; (2) the training, testing, and certification of pilot car operators, police officers, and truckdrivers in the movement of oversize/overweight loads; (3) the use of height poles and traffic controls; (4) how to conduct route surveys; (5) the maneuvering limitations of heavy-haul vehicles; (6) the effects of fatigue on performance; (7) the need to assess the dangers at railroad crossings, particularly for low-clearance vehicles; and (8) the need and requirements to notify the railroads before an oversize/overweight vehicle is escorted across a highway-rail grade crossing.

On January 25, 2002, the California Professional Escort Car Association, advised the Safety Board that it had formed a committee to address the issues brought to its attention in the Glendale accident report. In addition, Safety Board staff made two presentations during the last 6 months at the association's meetings. On April 3, 2002, the Safety Board classified Safety Recommendations H-01-32 and -33 "Open—Acceptable Response" to the California Professional Escort Car Association. The status to the other recipients of these recommendations is "Open—Await Response."

To the Federal Highway Administration and the American Association of State Highway and Transportation Officials:

H-01-34

Encourage the States to adopt the model oversize/overweight vehicle movement guidelines, as addressed in Safety Recommendations H-01-31 and -33, and once developed, to require that oversize/overweight vehicle movements conform to the guidelines. ("Open—Await Response")

To the City of Glendale, California:

H-01-35

Install low-clearance highway-railroad grade crossing signs (W10-5s) at the Grandview Avenue crossing and evaluate other crossings to determine whether the signs are warranted and, if so, install them.

On January 31, 2002, the City of Glendale California advised the Safety Board that on December 28, 2001, low-clearance highway-rail grade crossing signs (W10-5s) were installed at the Grandview Avenue crossing. On April 8, 2002, the Safety Board learned that all other grade crossings were inspected and did not warrant the signs. Accordingly on May 17, 2002, the Safety Board classified Safety Recommendation H-01-35 "Closed—Acceptable Action."

To the Commercial Vehicle Safety Alliance, the International Association of Chiefs of Police, and the National Sheriffs' Association:

H-01-36

Notify your members of the circumstances of the Glendale, California, accident and encourage them to train their officers to make sure (1) that documentation regarding permits is reviewed and verified; (2) that safety briefings to discuss routings and special conditions, including the hazards associated with moving oversize/overweight vehicles over grade crossings, are conducted; (3) that provisions for handling off-route loads are in place; and (4) that necessary notification to the railroads is made before an oversize/overweight vehicle is escorted across a highway-rail grade crossing. ("Open—Await Response")

To the Specialized Carriers & Rigging Association:H-01-37

Notify your members of the circumstances of the Glendale, California, accident and during in-service training for heavy-haul drivers, (1) highlight the potential hazards associated with moving low-clearance trailers over grade crossings and (2) emphasize the need to notify the railroads before an oversize/overweight vehicle is escorted across a highway-rail grade crossing. (“Open—Await Response”)

On March 12, 2002, the Specialized Carriers & Rigging Association advised the Safety Board that it has been actively working with the Board for 20 months to educate the association’s members on oversize/overweight accidents. Safety Board staff made presentations at three transportation and safety conferences over the past 12 months. In addition, the association agrees with the fundamental premise that improved planning, communications, and training can help promote safety performance and help reduce accidents, injuries, fatalities, and property losses. Also, the association indicated that it welcomed the opportunity to work cooperatively with the appropriate organizations to develop guidelines and training to foster improvements in pilot car operations and in the general movements of oversize/overweight loads.

Appendix C

Florida Department of Transportation Brochure and Applicable State Statutes for Railroad Authority

Note: The brochure was available at one time only, some time before 1997.

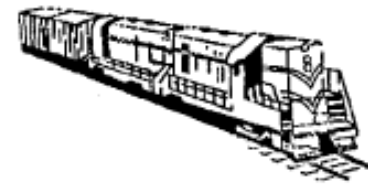
Important Telephone Numbers

(for notification purposes or to assist in meeting the requirements of F.S. 316.170)

- AMTRAK(800) 232-0144
- THE BAY LINE RAILROAD, LLC
.....(850) 785-4609
- APALACHICOLA NORTHERN RAILROAD
COMPANY.....8a-5p (850) 229-7411
.....5p-8a (850) 648-4412
..... (850) 229-8632
- ALABAMA AND GULF COAST RAILWAY
.....(334) 575-5008
- CSX TRANSPORTATION, INC.
..... (800) 232-0144
- FLORIDA DEPARTMENT OF
TRANSPORTATION - RAIL OFFICE
..... (850) 414-4500
- FLORIDA MIDLAND, CENTRAL, AND
NORTHERN RAILROADS
..... 8a-5p (407) 880-8500
..... 5p-8a (407) 849-7898
- FLORIDA EAST COAST RAILWAY
COMPANY(800) 342-1131 ext. 2302
- FLORIDA WEST COAST RAILROAD
COMPANY 8a-5p (352) 463-1103
- GEORGIA AND FLORIDA RAILROAD
COMPANY 6a-midnight (912) 435-6629
- NORFOLK SOUTHERN RAILWAY
CORPORATION (800) 946-4744
- SEMINOLE GULF RAILWAY
..... (941) 275-6060
- SOUTH CENTRAL FLORIDA EXPRESS
..... 6a-10p (941) 983-3163
..... 10p-6a (941) 983-3348
- TRI-COUNTY COMMUTER RAIL
AUTHORITY (800) 232-0144



Florida Department of Transportation
605 Suwannee Street, MS-25
Tallahassee, FL 32399-0450
(850) 414-4500 Suncom: 994-4500
FAX: (850) 922-4942 Suncom: 292-4942

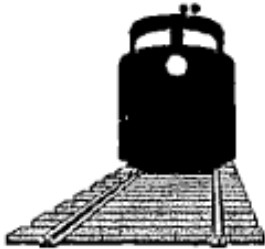


**Florida DOT
Low Clearance
Information**

*Don't get hung up
on the tracks!!!!*



Revised 12/97



The most important information you can provide to response personnel is the AARDOT crossing identification number which should be located on the crossbuck signpost, the signal mast, or the control box. Here is an example of an identification number:

**CSXT
624789N**

U.S. DOT - AAR CROSSING INVENTORY NUMBER

If you are unable to find the AARDOT crossing identification number, please remember to provide as much information as you can about the location of the crossing.

You need to know that:

Trains may appear from either direction at any time.

- Trains may take a mile (5280 feet) or more to stop.
- You should not step on or walk along the rails.
- Every 90 minutes a car/train crash occurs in the U.S.

Source: National Operation Lifesaver, Inc.

Florida law allows for \$100 in fines for violations at highway-rail grade crossings.

If your vehicle stalls or gets hung up on the railroad tracks or stalls within 15 feet of the tracks, you should get out of your vehicle and call for help immediately. If a train is coming and your vehicle gets hung up on the tracks or stalls within 15 feet of the tracks, you should get out of your vehicle immediately and run away from the track toward the direction from which the train is coming. This will help you avoid flying glass and debris which can be extremely hazardous in the event of a collision.

Remember . . .

only the driver can prevent crossing hang ups on low clearance vehicles.



For Emergencies Call:

- (1) Local Police 911
- (2) Florida Highway Patrol
Primary (cellular phones)*FHP
Alternate (800) 525-5555
 (850) 488-8676
- (3) Florida Division of Emergency
 Management(800) 320-0519
 (850) 413-9900
 (850) 413-9911

Florida Statute 316.170:

Moving heavy equipment at railroad grade crossings.

(1) No person shall operate or move any crawler-type tractor, steam shovel, derrick, or roller or any equipment or structure having a normal operating speed of 10 or less MPH or a vertical body or load clearance of less than 1/2 inch per foot of the distance between any two adjacent axles or in any event of less than 9 inches, measured above the level surface of a roadway, upon or across any tracks at a railroad grade crossing without first complying with this section.

(2) Notice of any such intended crossing shall be given to a station agent or other proper authority of the railroad, and a reasonable time shall be given to the railroad to provide proper protection at the crossing.

(3) Before making any such crossing the person operating or moving any such vehicle or equipment shall first stop the same no less than 15 feet nor more than 50 feet from the nearest rail of the railroad and while so stopped shall listen and look in both directions along the track for any approaching train and for signals indicating the approach of a train, and shall not proceed until the crossing can be made safely.

(4) No such crossing shall be made when warning is being given by automatic signal or crossing gates or a flagger or otherwise of the immediate approach of a railroad train or car. If a flagger is provided by the railroad, movement over the crossing shall be under his or her direction.

Appendix D

State Railroad Notification Requirements

State	Permit office	Specialized Carriers & Rigging Association	Federal Railroad Administration/ State law book	State motor vehicle code
<i>Alabama</i>	No	No	No	No ^f
Alaska	No ^a	No	Yes	Yes
Arizona	No	No ^c	Yes	Yes
<i>Arkansas</i>	No	No ^c	Yes	Yes
California	No	No	No	No
<i>Colorado</i>	No	Yes	Yes	Yes
Connecticut	No	No ^c	No	No
Delaware	No	Yes	Yes	Yes
<i>Florida</i>	Yes ^b	Yes	Yes	Yes
<i>Georgia</i>	No	Yes	Yes	Yes
Hawaii	No	No	No	No
Idaho	Yes	Yes ^c	Yes	Yes
Illinois	Yes	Yes	Yes	Yes
Indiana	Yes	Yes	Yes	Yes
Iowa	No	Yes	Yes	Yes
<i>Kansas</i>	No	Yes ^d	Yes	Yes
Kentucky	No	No	No	No
Louisiana	Yes	Yes	Yes	Yes
Maine	No	No	No	No
Maryland	No	Yes	Yes	Yes
Massachusetts	No	No	No	No
Michigan	No	No	Yes	Yes

State	Permit office	Specialized Carriers & Rigging Association	Federal Railroad Administration/ State law book	State motor vehicle code
Minnesota	No	No ^e	No	No ^f
Mississippi	No	No ^e	Yes	Yes
Missouri	No	No	No	No
Montana	No	Yes	Yes	Yes
Nebraska	No	No ^e	No	No ^f
Nevada	No	No ^e	No	No ^f
New Hampshire	No	No ^e	Yes	Yes
New Jersey	No	Yes	Yes	Yes
New Mexico	Yes	No ^e	Yes	Yes
New York	No ^g	No ^f	No ^f	No ^f
North Carolina	Yes	Yes	Yes	Yes
North Dakota	No	No ^f	No ^f	No ^f
Ohio	Yes	Yes ^h	Yes ^h	Yes ^h
Oklahoma	No	No ^f	No	No
Oregon	No	No ^e	Yes	Yes
Pennsylvania	No	Yes	Yes	Yes
Rhode Island	No	No	Yes	Yes
South Carolina	Yes	Yes ^c	Yes	Yes
South Dakota	No	No ^e	Yes	Yes
Tennessee	No	No ^e	No ^f	No ^f
Texas	No	No ^e	Yes	Yes
Utah	No ⁱ	No ^f	Yes	Yes
Vermont	No	No	No ^f	No ^f
Virginia	No	Yes ^j	Yes ^l	Yes ^j
Washington	No ^k	Yes	Yes	Yes
West Virginia	Yes	No	Yes	Yes

State	Permit office	Specialized Carriers & Rigging Association	Federal Railroad Administration/ State law book	State motor vehicle code
Wisconsin	No	No	No	No
Wyoming	No	No	Yes	Yes

^a Notification required only for vehicles with a height of 17 feet or more and a length of 150 feet or more.

^b The Florida Permit Office indicated that it does not routinely verify that an oversize vehicle will traverse a grade crossing.

^c Only lists the statute number.

^d Applies only to slow-moving vehicles--speed not specified. The text of the Kansas law does include a low-ground clearance provision.

^e Indicates "No rule on file."

^f Specified vehicles are required to stop and then proceed with caution.

^g State Permit Office Policy that proof of notification is required prior to the issuance of special moving permit.

^h Notification required for vehicles with a sustained speed of not more than 3 mph and a ground clearance of less than 9 inches.

ⁱ Utah requires vehicles/loads over 16 feet traversing highway-railroad grade crossings with railroad warning lights cantilevered over the grade crossing to notify the railroad before traversing the crossing.

^j Rule does not apply in cities or towns.

^k Washington requires vehicles over 16 feet wide, over 16 feet in height, and weighing over 200,000 pounds to notify the railroad before traversing a highway-railroad grade crossing.

