



National Transportation Safety Board

Railroad Accident Brief

Norfolk Southern Employee Fatality During Switching Operations

The Accident

On August 12, 2015, at 10:39 p.m., central daylight time, a Norfolk Southern Railway Company (NS) conductor trainee working at the Lone Star Gas facility (H 82) on the NS Alabama Division in Petal, Mississippi, was killed when he was pinned between two tank cars that were being coupled on the industry track.¹ The weather at the time of the accident was 77°F and partly cloudy.

The accident occurred inside the Lone Star liquefied petroleum gas (LPG) transloading facility in Petal, Mississippi, about 5 miles east of Hattiesburg. H 82 was east of the NS main track, a siding track, and a back track. Train movements on the main track were authorized by track warrants and governed by operating rules, general orders, timetable instructions, and the signal indications of an absolute block system.² Figure 1 is a diagram of the incident location.

¹ All times in this brief are central daylight time. H 82 is the NS designation for this facility.

² *Norfolk Southern Operating Rules*, "Rule 271: Track Signaled in Both Directions – Mandatory Directive Authorizes Movement," effective January 1, 2015.

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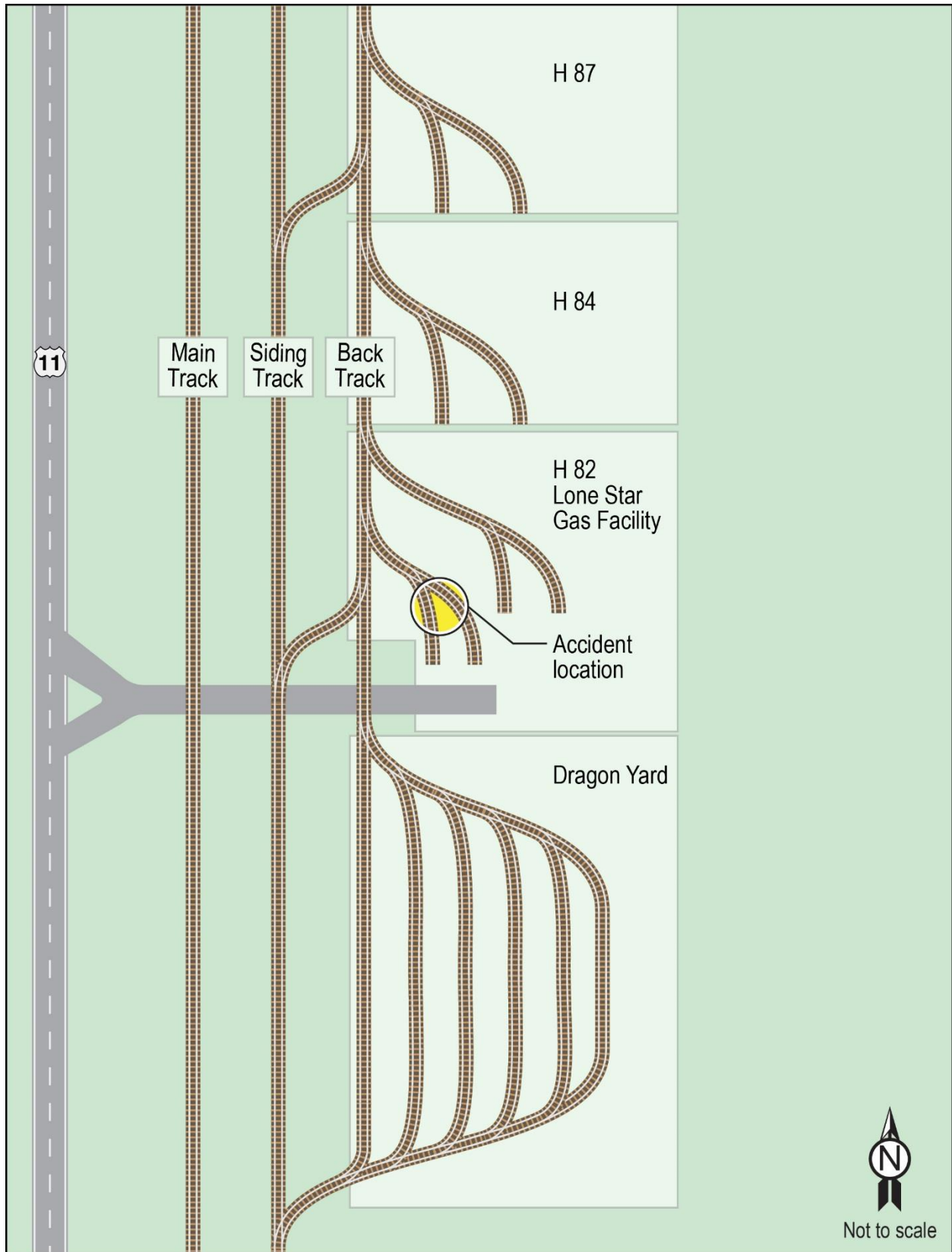


Figure 1. Accident location.

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Inside the facility were two tracks separated by a pipe rack. The pipe rack was an elevated structure with a walkway and a series of pipes and valves used in transloading LPG from railroad tank cars. The pipe rack was 1,100 feet long, with 11 spots for tank cars on each side of the rack. (See figure 2.)



Figure 2. Path between the tank cars and unloading rack in the H 82 gas plant.

The railcars were spotted by NS train crews. The railcars had to be spotted at locations where moveable walkways could be used for employees to reach the top of the railcar to couple lines for transloading the material. Proper spotting of the cars required a nominal space of 9 to 10 feet in between railcars. The tracks adjacent to the pipe rack were tangent with no noticeable grade.

Overhead lighting was located along the pipe rack. There were 10 light towers about 100 feet apart with two lights (one facing north and one facing south) on each pole. The light towers provided lighting between the tank cars and the pipe rack.

On the day of the accident, the crew reported for duty at the NS Hattiesburg Yard at 3:00 p.m. The engineer set up and inspected the locomotive, while the trainmaster held a job briefing with the conductor, brakeman, and conductor trainee. Later, the conductor held a job briefing with the engineer, who was not present at the initial job briefing.

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The crew successfully moved loaded and residue tank cars between two gas plants and Dragon Yard in Petal, Mississippi, about 5 miles from the Hattiesburg Yard.³ After coupling the locomotive to the loaded tank cars destined for the Lone Star Gas facility, the train crew took a break. The conductor held a job briefing regarding the work they were going to perform at the H 82 gas plant. The work involved taking 22 loaded tank cars from Dragon Yard and swapping them with the 22 residue tank cars—11 spotted on each side of the transloading rack—at H 82. The conductor walked the short distance to the south entrance of the plant. Meanwhile, the train crew departed Dragon Yard on the back track to remove cars at the H 82 gas plant. The train continued north and the brakeman and conductor trainee were dropped off at the hand-operated switch to access H 82. The brakeman counted the cars down to the engineer until the rear of the train was north of the switch. The brakeman lined the switch, removed the derail, and radioed the engineer to inform him the switch was lined and the derail was off to enter H 82.

The brakeman and conductor trainee were riding on the rear car when the brakeman radioed the engineer to shove six car-lengths back to a safety stop.⁴ Event recorder data indicated the train moved about 460 feet at 5 mph and stopped. The engineer was notified by the brakeman that he and the conductor trainee were on the ground. They were walking between the tank cars and the unloading rack when the brakeman requested a “half car to a bunch”, which was followed by the brakeman radioing “five to the next one”.⁵ The engineer continued to shove until he heard “that’ll do”, after which he stopped the train movement. Event recorder data indicated the train moved about 95 feet and stopped. At that time, only two residue tank cars were coupled. The train crew told investigators that they planned to perform a rolling couple until all 11 cars were coupled.⁶ They would then request a “three-step protection”, which would allow them to step between the tank cars and begin to connect the air hoses together.⁷ Afterward, the brake pipe would be charged and the handbrakes would be released.

The brakeman told investigators that after the train started shoving, he and the conductor trainee began walking south toward the next tank car to be coupled. The brakeman explained that when he started walking, he was facing north watching the first couple and he then turned to face south toward the second couple. As he turned, he noticed a “flash or something come in front”, which prompted him to radio the engineer, “that’ll do”. He said that he stopped the train shove because he recognized that people were near the track, and he thought a plant worker may have been on the track while they were coupling the tank cars. However, after walking to the second couple, he discovered the conductor trainee between the second and third cars.

Investigative Factors

Conductor Training

The 20-year-old conductor trainee had been employed by NS for 45 days. He had completed Phase I of his training, which consisted of 19 days of classroom and field training on

³ *Residue tank car* describes a tank car which has had its contents unloaded to the maximum extent practicable, but that has not been refilled or cleaned and purged to remove any hazardous material or vapors.

⁴ *Safety stop* requires the train to come to a complete stop to allow crewmembers to get on or off equipment.

⁵ “*Half car to a bunch*” refers to the half of a railcar-length distance needed to move to couple two railcars together. “*Five to the next one*” refers to the five railcar-length distance needed to move to couple the next two railcars.

⁶ *Rolling couple* refers to the process of shoving and coupling to the first railcar and continuing shoving to couple the remaining railcars. NS personnel indicated that train crews routinely performed rolling couples at some locations.

⁷ See *Norfolk Southern Operating Rules*, “NS Safety Critical Rule 22: *Fouling Equipment*,” effective January 1, 2015, for more information.

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basic railroading at the NS Training Center in McDonough, Georgia. The training syllabus included training on basic railroad safety, mounting/dismounting equipment, handbrakes, operating rules, basic air brakes, freight car types, locomotive overview, signals and communication, train clearance, switching, and hand signals. There were no formal guides or training manuals created for the trainees, just rudimentary maps made locally by crews or supervisors.

Following their time at the training center, the trainees then return to their NS division and are assigned personal protective equipment, and other items such as switch keys, a lantern, and a handheld radio. However, there is evidence that the conductor trainee was never issued a radio.

The NS training coordinator told NTSB investigators that phase II of NS conductor training typically consists of 99 days of on-the-job learning, with a goal to qualify conductor trainees during this time. During this phase of instruction, the trainees are assigned to train crews, and should be observed and evaluated by the local supervisors. Trainee status is reviewed weekly with a supervisory conference call between all lead officers in the division and the training coordinator. The trainees work a 6-day work week that consists of 5 days on a train and 1 day of classroom training with a large group, including supervisors. During the 21 days the conductor trainee was assigned to the division, he did not have any documented evaluations or rules checks.

The training coordinator further explained that the training center does not teach rolling couples. The classroom training teaches trainees another method which has them couple, turn on the air, check the railcar, and then go to the next railcar to make that coupling. He stated that although the practice of rolling couples was probably in place for a long time, there was nothing written in the rules or guidelines that explains a rolling couple.

Noncontributing Factors

The following were not factors in the accident:⁸

- **Use of portable electronic devices:** The investigation determined the A61 train crew did not have any portable electronic devices in their possession on the day of the accident.
- **Impairment due to natural disease, drugs, or alcohol:** Following the accident, in compliance with federal regulations, specimens obtained from the conductor trainee were tested and found to be negative for the presence of illicit drugs and alcohol. Further, the autopsy identified no evidence of any natural disease, drugs, or alcohol that would have impaired him around the time of the accident.
- **Fatigue:** A 72-hour work/rest history was obtained for all four crewmembers of train A61. No evidence of fatigue was found.
- **Tank car defects:** The Federal Railroad Administration (FRA) conducted an inspection on the two railcars the conductor trainee was pinned between that identified minor mechanical defects, but none of those defects caused or contributed to the accident.
- **Track:** There were no defects found with the track.
- **Emergency response:** Emergency services responded to the scene.

⁸ For additional information, please see the docket for NTSB accident DCA15FR013.

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Probable Cause

The National Transportation Safety Board determines that the probable cause of the accident was the conductor trainee stepping in between two tank cars without protection for an unknown reason during the shove movement.

For more details about this accident, visit www.nts.gov/investigations/dms.html and search for NTSB accident ID **DCA15FR013**.

Adopted: September 28, 2016

The NTSB has authority to investigate and establish the facts, circumstances, and cause or probable cause of a railroad accident in which there is a fatality or substantial property damage, or that involves a passenger train. (49 U.S. Code § 1131 - *General authority*)

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties . . . and are not conducted for the purpose of determining the rights or liabilities of any person.” 49 *Code of Federal Regulations*, Section 831.4. Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report. 49 *United States Code*, Section 1154(b).
