



Kansas City Southern Railway Conductor Fatality

Tupelo, Mississippi
December 23, 2020

1. Factual Information

1.1 Accident Description

On December 23, 2020, about 6:55 a.m. local time, the conductor of Kansas City Southern Railway Company (KCS) train L-CO302-22 was struck and fatally injured by the train in the Tupelo Rail Yard in Tupelo, Mississippi.¹ The accident occurred on main track 1 at milepost 278.0 on KCS’s Artesia Subdivision. (See figure 1.) At the time of the accident, the train consisted of 3 locomotives and 22 railcars. It was dawn, the sky was clear, and the temperature was 44°F with light winds from the south.

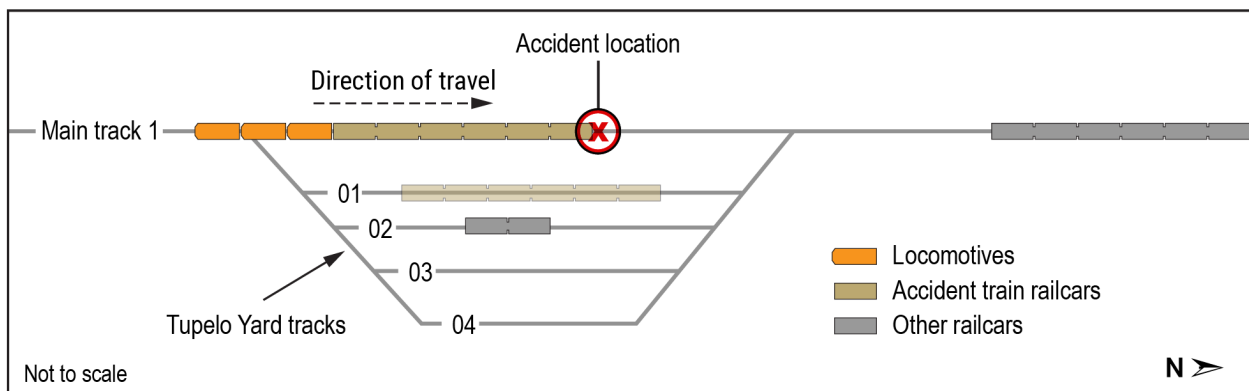


Figure 1. Diagram of accident location.

¹ (a) Visit [ntsb.gov](https://www.nts.gov) to find additional information in the [public docket](#) for this NTSB investigation (case number RRD21LR006). Use the [CAROL Query](#) to search safety recommendations and investigations. (b) All times in this report are local time unless otherwise noted.

The crew, which consisted of an engineer and a conductor, operated their train from yard track 2 to yard track 1 to pick up 22 stored railcars. After picking up the 22 railcars, the conductor climbed onto the northeast corner of the lead railcar to direct the train movement. Using his portable radio, he then directed the engineer to shove the train north along main track 1 the length of 40 railcars to couple with additional railcars.² After moving the train about 15 railcar lengths, the locomotive engineer, who had not received additional instructions from the conductor, applied the independent brake to reduce the train's speed and prepare to stop in accordance with the General Code of Operating Rule (GCOR) on radio contact.³ Event recorder data showed that the engineer maintained an average speed between 9 and 10 mph before braking. As the train began to slow, the conductor reported that the train was 10 railcar lengths from coupling to the nearest railcar. In his interview with NTSB investigators, the engineer said that the distance reported by the conductor was shorter than the engineer had expected given how far the train had traveled. The engineer said he increased the locomotive independent brake rate, and the train's speed then decreased from 9 mph to 6 mph in about 3 seconds.

During independent braking, energy from the locomotive's deceleration is transmitted down the train through the mechanical couplers, an effect called slack action.⁴ Because there is slack (a small separation) between each railcar coupler, there is a delay between each railcar as it begins slowing and when it stops. When the energy pulse reaches the last railcar, the rest of the train has already decelerated over a distance proportional to the total amount of slack in the train. This transmitted energy, or slack action, often results in a sudden energy pulse.

As the engineer prepared the train to couple to the stationary cars, a KCS employee working in the area heard a commotion over the conductor's radio. Both the KCS employee and engineer then heard distorted communication followed by the conductor communicating over his radio that he'd been injured. By the end of the communication, the engineer had stopped the train. The KCS employee called 911.

² (a) *Shoving* is the process of pushing railcars or a train from the rear. (b) Railroad personnel commonly use railcar lengths to communicate distances during switching operations.

³ (a) The *independent brake* is a manually operated brake in the locomotive used to apply and release locomotive brakes independently of train brakes, which apply braking force to each car simultaneously. (b) Under General Code of Operating Rule (GCOR) 5.3.7, radio communications for shoving movements must specify the direction and distance of the movement. In the absence of further communication, movements must cease within half the distance specified in the last communication. See "5.3.7 Radio Response" in *General Code of Operating Rules*, 8th ed., April 1, 2020.

⁴ (a) *Slack action* is the free movement of a railcar before it transmits motion and energy to an adjoining coupled car. (b) Train makeup and operational circumstances can preclude minimizing slack action by applying the brakes on each car.

Tupelo Fire Department responders arrived on-scene within 10 minutes and transported the conductor to North Mississippi Medical Center, where he died from his injuries.

1.2 Before the Accident

The crew reported for duty on December 22, 2020, about 11:00 p.m., at KCS's Artesia Rail Yard in Artesia, Mississippi, and was assigned to work northbound KCS train LCO309-22 to Saltillo, Mississippi. After arriving, the crew met KCS southbound train LCO302-22, which originated in KCS's Corinth Rail Yard. The northbound crew was then assigned to operate the southbound train LCO302-22 to the Tupelo Rail Yard.

After arriving at the north end of Tupelo Rail Yard, the crew uncoupled and secured railcars 3 through 46 on main track 1, leaving two railcars connected to the locomotives. The crew then proceeded to the south end of Tupelo Rail Yard where they uncoupled and secured the remaining two railcars on yard track 2. The crew then picked up 22 railcars from yard track 1 and returned to main track 1 to recouple with the cars left on main track 1. The accident occurred on main track 1. (See figure 2.)

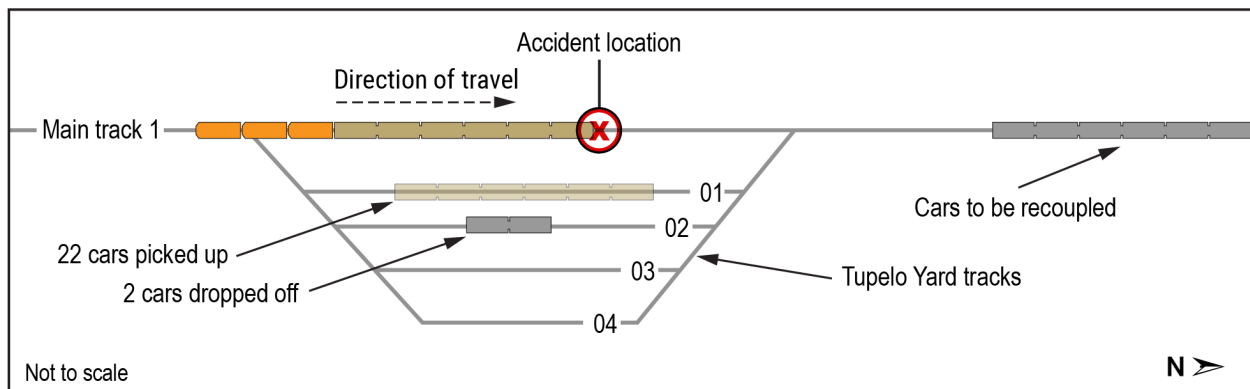


Figure 2. Diagram of accident location and switching operation.

1.3 Personnel Information

The conductor was hired on September 27, 2010, by KCS as a conductor. He was certified as a locomotive engineer and a conductor for KCS.⁵ A review of the conductor's training records showed that his KCS conductor qualifications were current. At the time

⁵ Engineers and conductors are required to be certified in accordance with Title 49 *Code of Federal Regulations* Parts 240 and 242, Qualification and Certification of Locomotive Engineers and Qualification and Certification of Conductors.

of the accident, the conductor was working from the extra board list out of the Artesia Rail Yard.⁶

Postaccident toxicology testing on the conductor for alcohol and other drugs was conducted in accordance with FRA regulations.⁷ The results were negative for all tested substances. The autopsy report from the Mississippi State Medical Examiner determined the cause of death to be blunt force trauma.

1.4 Conductor's Riding Position

The railcar that the conductor was riding was a DOT-111 tank car. The railcar was equipped with a foot stirrup and vertical handhold at each corner. (See figure 3.)



Figure 3. The end of the railcar where the conductor was riding.

⁶ An extra board list is a list of employees who may be assigned to train crews when extra trains are run, when regular crews have not had sufficient rest time before they can legally be required to return to duty, or when relief personnel are required on regular crews.

⁷ The testing screened for substances including amphetamines, barbiturates, benzodiazepines, cocaine, alcohol and cannabis metabolites, methadone, methaqualone, MDA-analogues, opiates, 6-acetylmorphine, oxycodone, opiates, phencyclidine, and propoxyphene.

[Alt text: Photo shows a tank car sitting on railroad track with callout boxes pointing to the vertical handhold and foot stirrups. To the left of the tank car are standing railcars and an empty railroad track.]

NTSB investigators could not determine the conductor's stance while riding the northeast corner of the railcar, including how he was using the handrail and stirrup and whether he was maintaining three points of contact.⁸ None of the KCS employees interviewed during the investigation witnessed the accident, and the train's forward- and rear-facing locomotive image recorders did not have a view of the conductor.

1.5 Operating Rules

Train operating rules at KCS are outlined in KCS Safety Rules and GCOR. Safety rules associated with riding equipment and radio communication during shoving movements that were in effect at the time of the conductor's fatality are discussed below.

1.5.1 KCS Safety Rule on Riding Equipment

KCS's Safety Rule GS-9 specifies the conditions for riding moving train equipment, including tank cars.⁹ The rule requires, in part, that employees riding equipment face in the direction of movement, maintain three-point contact with equipment, protect against slack action, and not jump between cars.

1.5.2 General Code of Operating Rules on Radio Use

Communication between the conductor and engineer was governed by GCOR 5.3.7, which states that radio communications for shoving movements must specify the direction and distance of the movement. In the absence of further instructions (communication), movements must cease within half the distance specified in the last communication.

1.6 Postaccident Actions

On December 23, 2020, KCS issued a safety alert to its employees reiterating GCOR critical rules relevant to safety in switching operations and the need for situational awareness. The alert directed supervisors to thoroughly review the critical rules during

⁸ A person riding equipment has *three points of contact* when they are using three limbs to maintain their position; for example, both feet on a stirrup and a hand gripping a handrail.

⁹ The Kansas City Southern Railway Company. "GS-9 Riding Moving Equipment" in *Safety Rules*, April 1, 2020.

safety briefings or contacts with each employee, stressing the importance of compliance and maintaining situational awareness.

2. Analysis

On the morning of the accident, the conductor was riding the east side of the lead railcar, but this investigation could not determine the conductor's stance or whether he was maintaining three-point contact. The movement occurred on straight track while the train was shoving railcars during a switching operation. Event recorder data showed that during this movement the engineer reduced the train's speed by about 3 mph in about 3 seconds. This speed reduction was within normal operating actions for switching operations, but it likely created slack action. As discussed above, slack action generated by independent braking can build up cumulatively as each railcar transmits motion and energy through the couplers, increasing with distance from the locomotive. When the locomotive shoving the railcars reduced its speed using only the locomotive brake, this force caused slack action through the train and ultimately on the lead car being ridden by the conductor.

The conductor was likely holding on to a vertical handhold while operating a handheld radio and may have been in an unstable position while preparing to make the coupling. If slack action occurred unexpectedly, the conductor could have fallen into the path of the moving train.

3. Probable Cause

The National Transportation Safety Board determines that the probable cause of the December 23, 2020, fatality of a Kansas City Southern Railway conductor was his fall from the railcar he was riding into the path of the moving train during switching operations because of unexpected slack action experienced in his train while in an unstable position.

The National Transportation Safety Board (NTSB) is an independent federal agency dedicated to promoting aviation, railroad, highway, marine, and pipeline safety. Established in 1967, the agency is mandated by Congress through the Independent Safety Board Act of 1974, to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

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" (Title 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 (Title 49 *United States Code* section 1154(b)).

For more detailed background information on this report, visit the NTSB investigations website and search for NTSB accident ID RRD21LR006. Recent publications are available in their entirety on the NTSB website. Other information about available publications also may be obtained from the website or by contacting—

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