National Transportation Safety Board

Railroad Accident Brief

Metro-North Railroad Derailment

Accident No.:	DCA14MR002
Location:	Bronx, New York
Date:	December 1, 2013
Time:	7:19 a.m. eastern standard time
Railroad:	Metro-North Railroad
Property damage:	$9 million
Injuries:	61
Fatalities:	4
Type of accident:	Derailment

The Accident

On Sunday, December 1, 2013, at 7:19 a.m. eastern standard time, southbound Metro-North Railroad (Metro-North) passenger train 8808 derailed at milepost 11.35 on main track 2 of the Metro-North Hudson Line.[1] The train originated in Poughkeepsie, New York, with a destination of Grand Central Station in New York, New York. The train consisted of seven passenger cars and one locomotive; the locomotive was at the rear of the train in a push configuration. All passenger cars and the locomotive derailed. The derailment occurred in a 6° left-hand curve where the maximum authorized speed was 30 mph. The train was traveling at 82 mph when it derailed. As a result of the derailment, 4 people died and at least 61 persons were injured. Metro-North estimated about 115 passengers were on the train at the time of the derailment.

Metro-North estimated damages at more than $9 million. At the time of the accident, the weather was 39°F, cloudy skies, and clear visibility.

Brief Narrative

The Metro-North crew reported for duty at Poughkeepsie at 5:04 a.m. The crew took charge of train 8808 and departed Poughkeepsie en route to Grand Central Station. The train made its first stop at New Hamburg, and then made eight additional stops prior to the derailment. Train 8808 made its last stop at Tarrytown, New York, which is about 14 miles north of the accident site.

[1] All times in this brief are eastern standard time.

Upon passing Riverdale, about 2 1/2 miles north of the accident site, the engineer increased the train speed to 70 mph. The engineer maintained full throttle, and the train speed increased to 82 mph. As the train entered a 30-mph curve at milepost 11.4, the train derailed. During the derailment sequence many of the cars slid on their right sides in the direction of travel, and window glazing (panes) detached from the cars. Based on the locations of the four passengers who died at the end of the accident sequence, the extent of dirt and plant material in wounds and the nature of their injuries, all four were completely or partially ejected from the train through window openings. In addition, two of the seriously injured passengers sustained severe injuries consistent with contacting the ground outside the train as the cars slid along the ballast.

The engineer later told investigators that he remembered feeling “dazed” or “hypnotized” just before the derailment. The train brakes were not applied before the derailment.

Figure 1. Accident scene.

The investigation determined that the following were not factors in the accident: signal system defects; the track condition; the train’s mechanical condition; and the actions of the Metro-North rail traffic controller.

Engineer Medical Condition

Metro-North medical records indicate that the engineer had passed all required physical examinations. The engineer's personal medical records indicate that he had complained of fatigue prior to the accident and had been diagnosed with low testosterone and later hypothyroidism. He was obese with a body mass index of 36.4 in the week following the accident.[2] During interviews following the accident, the engineer reported that his wife had complained of his snoring.

After the accident, the engineer had a sleep evaluation that identified excessive daytime sleepiness and underwent a sleep study that resulted in a diagnosis of severe obstructive sleep apnea (OSA). The engineer had multiple OSA risk factors, including obesity, male gender, snoring, complaints of fatigue, and excessive daytime sleepiness. Although the engineer had these multiple risk factors and multiple visits with health care providers, neither his personal medical providers nor his occupational health evaluations by Metro-North identified his OSA.

Following the sleep study, successful treatment of the engineer's OSA was accomplished within 30 days of the diagnosis.

The Metro-North medical protocols and the Federal Railroad Administration (FRA) regulations in place at the time of the accident required triennial vision and hearing testing but did not require screening safety sensitive personnel for sleep disorders or any other medical conditions.[3]

Engineer Work Shift Change

Beginning on November 18, 2013, less than 2 weeks before the accident, the engineer's work schedule changed dramatically as a result of a routine job bid process, called the "pick."[4] After more than 2 years working shifts beginning in the late afternoon or evening and ending in the early morning, the engineer began to work shifts that that began in the dark of early morning (4-5 a.m.) and continued until early afternoon. Adjusting to a new wake/sleep schedule can take days or longer, depending on the difference between the previous and current schedules and the quality of restorative sleep obtained. The engineer told investigators that on his new work schedule he began to awaken around 3:30 a.m. and retire between 8:00 p.m. and 8:30 p.m. His wake/sleep cycle had now shifted about 12 hours. The engineer reported that his wake and sleep times varied in the days preceding the accident around the Thanksgiving holiday, which could have degraded his quality and quantity of sleep. Given the substantial shift in work schedules and the varied sleep/wake times, it is likely that the engineer had not adjusted fully to the new work schedule at the time of the accident. The engineer's OSA combined with his incomplete

[2] Body mass index (BMI) calculation is based on height and weight. A BMI of 25–30 is considered overweight, and a BMI over 30 is considered obese.

[3] Safety-sensitive positions are defined in FRA regulations at 49 CFR 209.303.

[4] As part of a collective bargaining agreement, Metro-North train crew work assignments are re-opened for seniority bid twice each year.

adjustment to a dramatic shift in work schedule most likely resulted in him being fatigued at the time of the accident.

Postaccident Actions

FRA Emergency Order 29 and Safety Advisory 2013-08

During the on-scene investigation, NTSB investigators determined that Metro-North trains exceeding the prescribed speed limits were not uncommon. As a result, on December 11, 2013, the FRA issued Emergency Order 29 which required Metro-North to take a number of immediate steps to ensure trains were not operated at an excessive speed. The FRA also issued Safety Advisory 2013-08 to all railroads on December 16, 2013, recommending that the railroads emphasize speed compliance to the operating employees.

Metro-North Train-Speed Enforcement Program

As a result of information developed during the on-scene NTSB investigation, Metro-North developed and implemented a train-speed enforcement program that involved radar speed checks and increased reviews of event-recorder data to confirm that engineers were adhering to speed limits.

FRA Safety Assessment of Metro-North

As a result of information obtained during this NTSB accident investigation and three additional ongoing NTSB Metro-North investigations, the FRA assembled a team to conduct a safety assessment of Metro-North operations. The FRA team interviewed Metro-North personnel, inspected Metro-North equipment, and reviewed Metro-North compliance with regulations. In March 2014, the FRA issued a report, *Operation Deep Dive, Metro-North Commuter Railroad Safety Assessment*, that contained a number of recommendations for improving safety on Metro-North. On May 15 2014, Metro-North submitted a response to the FRA addressing the recommendations in the FRA safety assessment report.

NTSB Recommendations

On February 18, 2014, the NTSB issued safety recommendations to Metro-North recommending the installation of permanent speed restriction signs, inward- and outward-facing audio and image recorders, and the use of the recordings to verify crew compliance with safety rules.[5]

[5] For more information, see the NTSB letter, dated February 18, 2014, to Metro-North in which the NTSB issued Safety Recommendations R-14-7 through -9. Safety Recommendation R-14-07 is classified "Open—Unacceptable Response" and Safety Recommendations R-14-08 and -09 are classified "Open—Acceptable Response."

Probable Cause

The National Transportation Safety Board determines that the probable cause of the accident was the engineer's noncompliance with the 30-mph speed restriction because he had fallen asleep due to undiagnosed severe obstructive sleep apnea exacerbated by a recent circadian rhythm shift required by his work schedule. Contributing to the accident was the absence of a Metro-North Railroad policy or a Federal Railroad Administration regulation requiring medical screening for sleep disorders. Also contributing to the accident was the absence of a positive train control system that would have automatically applied the brakes to enforce the speed restriction. Contributing to the severity of the accident was the loss of the window glazing that resulted in the fatal ejection of four passengers from the train.

For more details about this accident, visit www.ntsb.gov/investigations/dms.html and search for NTSB accident ID DCA14MR003.

Adopted: October 24, 2014

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

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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).