

NATIONAL TRANSPORTATION SAFETY BOARD
Public Meeting of April 28, 2015
(Information subject to editing)

**Chicago Transit Authority Train Collision with
Bumping Post and Escalator at O'Hare Station, Chicago, Illinois,
March 24, 2014**

This is a synopsis from the NTSB's report and does not include the Board's rationale for the conclusions, probable cause, and safety recommendations. NTSB staff is currently making final revisions to the report from which the attached conclusions and safety recommendations have been extracted. The final report and pertinent safety recommendation letters will be distributed to recommendation recipients as soon as possible. The attached information is subject to further review and editing.

EXECUTIVE SUMMARY

About 2:49 a.m. on March 24, 2014, Chicago Transit Authority train No. 141 collided with the bumping post near the end of the center pocket track at O'Hare Station. The lead car rode over the bumping post and went up an escalator at the end of the track. The escalator provided public access to enter O'Hare International Airport from the platform in the station, but no one was using it at the time of the accident. About 50 people were on the train at the time of the accident. Thirty-three injured passengers and the injured train operator were taken to the hospital. The estimated damage was \$11,196,796. The accident occurred in an underground station that was not impacted by weather conditions.

The National Transportation Safety Board determines that the probable cause of the accident was the failure of the train operator to stop the train at the appropriate signal due to falling asleep as a result of fatigue, which was the result of the challenges of working shiftwork, circadian factors, and acute sleep loss resulting from her ineffective off-duty time management. In addition, Chicago Transit Authority failed to effectively manage the operator's work schedule to mitigate the risk of fatigue. Contributing to the severity of the accident was Chicago Transit Authority's failure to identify the insufficient stopping distance and inadequate speed restriction at the center pocket track at O'Hare Station.

FINDINGS

1. None of the following was a factor in the accident: (1) mechanical condition of the train, (2) operator's experience operating transit trains, (3) personal electronic device use while operating the train, (4) alcohol or drug use, or (5) weather.
2. The train operator was experiencing the effects of a cumulative sleep debt, which contributed to her falling asleep.
3. The train operator was impaired by fatigue at the time of accident due to the challenges of working shiftwork, circadian factors, sleep deprivation, and failing to get adequate sleep during her off-duty time.
4. Chicago Transit Authority's changes to education and training on employee fatigue are a first step toward making all Chicago Transit Authority operating employees and managers aware of the effects of fatigue.
5. Transit agencies and the Federal Transit Administration have underutilized science-based tools—such as biomathematical models—to assess and manage the risks of operator fatigue in their work scheduling practices.
6. Identifying the training and certification needs of transit work schedulers would help them develop more effective work schedules for transit employees.
7. Work schedulers should have a strong understanding of factors that influence employee fatigue, including working night shifts, length of shifts, unplanned work, emergencies, and commute time to and from work.
8. The design of the center pocket track was not adequate to prevent a train from striking the bumping post near the end of the track.
9. The Chicago Transit Authority's System Safety Program did not include a hazard management program sufficient to identify hazards at existing facilities at the time of the accident.
10. A fully implemented transmission-based train control system would have prevented this accident by applying the train's brakes before the train could advance past the red stop signal.
11. Through the Moving Ahead for Progress in the 21st Century Act, the Federal Transit Administration has the legislative authority to require equipment standards on transit equipment and can now require event recorders.

PROBABLE CAUSE

The National Transportation Safety Board determines that the probable cause of the accident was the failure of the train operator to stop the train at the appropriate signal due to falling asleep as a result of fatigue, which was the result of the challenges of working shiftwork, circadian factors, and acute sleep loss resulting from her ineffective off-duty time management. In addition, Chicago Transit Authority failed to effectively manage the operator's work schedule to mitigate the risk of fatigue. Contributing to the severity of the accident was Chicago Transit Authority's failure to identify the insufficient stopping distance and inadequate speed restriction at the center pocket track at O'Hare Station.

RECOMMENDATIONS

As a result of this investigation, the NTSB makes 6 new safety recommendations to the Federal Transit Administration and 1 new safety recommendation Chicago Transit Authority.

To the Federal Transit Administration:

1. Develop a work scheduling program for rail transit agencies that incorporates fatigue science—such as validated biomathematical models of fatigue—and provides for the management of personnel fatigue risks, and implement the program through the state safety oversight program.
2. Establish (through the state safety oversight program) scientifically based hours-of-service regulations that set limits on hours of service, provide predictable work and rest schedules, and consider circadian rhythms and human sleep and rest requirements.
3. Identify the necessary training and certification needs for work schedulers in the rail transit industry and require the transit agencies—through the state safety oversight program—to provide additional training or certification for their work schedulers.
4. Require (through the state safety oversight program) rail transit employees who develop work schedules to complete initial and recurrent training based on current fatigue science to identify and mitigate work schedule risks that contribute to operator fatigue.
5. Require rail transit agencies to implement transmission-based train control systems that prevent train collisions.
6. Require that new or rehabilitated rail transit vehicles be equipped with event recorders meeting Institute of Electrical and Electronics Engineers Standard 1482.1 for rail transit vehicle event recorders.

To the Chicago Transit Authority:

7. Install a transmission-based train control system on all passenger train routes.