



Reduce Fatigue-Related Accidents

What is the problem?

Operating a train requires complex human interaction and an engineer's complete attention and proficient skill. All too often, however, engineers or safety-critical personnel supporting rail operations are impaired by fatigue stemming from insufficient or poor-quality sleep. Fatigue degrades a person's ability to stay awake, alert, and attentive to the demands of controlling their vehicle or doing their job safely. The effects of fatigue may not be recognized until it's too late.

Even when an individual has enough time to get rest, other issues—such as medical conditions, unpredictable or inverted work schedules, living environment, and personal choices—can affect one's ability to obtain quality sleep.

Fatigue research has found associations between rail crew fatigue and long working hours, heavy workload, early morning or night shifts, and insufficient sleep. Poor working environment, particular job roles, and individual differences also contributed to fatigue.

A 2006 Federal Railroad Administration-sponsored study determined that a fatigue model that predicts sleep lengths and worker effectiveness based on work schedule data could discriminate between accidents that were attributed to crew errors (human factors accidents) and those that did not.

The traveling public can unknowingly and unwillingly be placed at risk because a fatigued operator cannot safely perform his or her duties.



On September 29, 2016, a New Jersey Transit (NJT) train overrode a bumping post at the end of the track, and struck a wall of the Hoboken Terminal. One person on the passenger platform died; 110 passengers and crewmembers were injured. The NTSB determined that the probable cause of the accident was the failure of NJT train's engineer to stop the train after entering Hoboken Terminal due to the engineer's fatigue resulting from his undiagnosed severe obstructive sleep apnea.

Related reports:

RAB-18/01: New Jersey Transit Train Strikes Wall in Hoboken Terminal; Hoboken, New Jersey; September 29, 2016; Accident ID DCA16MR011

RAR-16/03: Collision of Two Union Pacific Railroad Freight Trains; Hoxie, Arkansas; August 17, 2014; Accident ID DCA14FR011

RAR-15/01: Chicago Transit Authority Train Collides with Bumping Post and Escalator at O'Hare Station; Chicago, Illinois; March 24, 2014; Accident ID DCA14FR007

RAB-14/12: Metro-North Railroad Derailment; Bronx, New York; December 1, 2013; Accident ID DCA14MR002

RAR-12/02: Collision of BNSF Coal Train with the Rear End of Standing BNSF Maintenance-of-Way Equipment Train; Red Oak, Iowa; April 17, 2011; Accident ID DCA11FR002

For detailed investigation reports, visit www.nts.gov

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Major rail investigations conducted between 2001 and 2012 in which fatigue was identified in the probable cause, as a contributing cause, or as a finding

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2019–2020 NTSB
MOST WANTED LIST OF
TRANSPORTATION SAFETY IMPROVEMENTS



What can be done?

Fatigue is a manageable threat to transportation safety that can be mitigated by a combination of science-based regulations, comprehensive fatigue risk management programs, and individual responsibility. We have issued more than 200 safety recommendations addressing fatigue across all modes of transportation.

25+

Fatigue-related
recommendations
issued between
1983 and 2018 to
improve rail safety



To address the problem of fatigue, the following actions should be taken:

Railroad Operators/Industry

- › Establish fatigue risk management programs and continually monitor their success to reduce risks for personnel performing safety-critical tasks. These programs take a comprehensive, tailored approach to address the problem of fatigue within an industry or workplace. Such programs include policies or practices to address scheduling, attendance, education, medical screening and treatment, personal responsibility during nonwork periods, task and workload issues, rest environments, commuting, and napping.
- › Collaborate to develop a model national labor agreement that supports effective programs for addressing sleep disorders and other medical conditions among safety-sensitive personnel.

Regulators

- › Provide guidance to operators, transit authorities, and physicians to help them identify and treat individuals at high risk for obstructive sleep apnea (OSA) and other sleep disorders.
- › Require railroads to medically screen employees in safety-sensitive positions for OSA and other sleep disorders.
- › Using current fatigue science, provide initial and recurrent training on work schedule issues to mitigate risks that contribute to operator fatigue.

On December 1, 2013, a Metro-North Railroad passenger train derailed on main track 2 of the Metro-North Hudson Line in the Bronx, New York. Four people died and at least 61 were injured. We determined 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 OSA, exacerbated by a recent circadian rhythm shift required by his work schedule.

- › Develop medical certification regulations for employees in safety-sensitive positions that include, at a minimum, a complete medical history (including specific screening for sleep disorders, a review of current medications, and a thorough physical examination), standard testing protocols across the industry, and central oversight of certification decisions for employees who fail initial testing. Consider requiring that medical examinations be performed by those with specific training and certification in evaluating medication use and health issues related to occupational safety on railroads.
- › Research new methods to identify fatigue and mitigate associated performance decrements in on-duty crews.

Medical Community

- › Ensure that board-certified physicians in family medicine receive enhanced and ongoing training so they can successfully identify risk factors for, evaluate, and treat OSA in their patients.

MWL
MOST WANTED LIST

Critical changes needed
to reduce transportation
accidents, injuries, and
fatalities

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The NTSB **MOST WANTED LIST** highlights safety issues identified from the NTSB's accident investigations to increase awareness about the issues and promote recommended safety solutions.

For more information visit www.nts.gov/mostwanted or contact SafetyAdvocacy@ntsb.gov

The NTSB is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. The NTSB determines the probable cause of the accidents and issues safety recommendations aimed at preventing future accidents. In addition, the NTSB carries out special studies concerning transportation safety and coordinates the resources of the federal government and other organizations to provide assistance to victims and their family members impacted by major transportation disasters.

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