Massachusetts Bay Transportation Authority

Commuter Rail Fatigue Management: Sleep Apnea

Fiscal and Management Control Board

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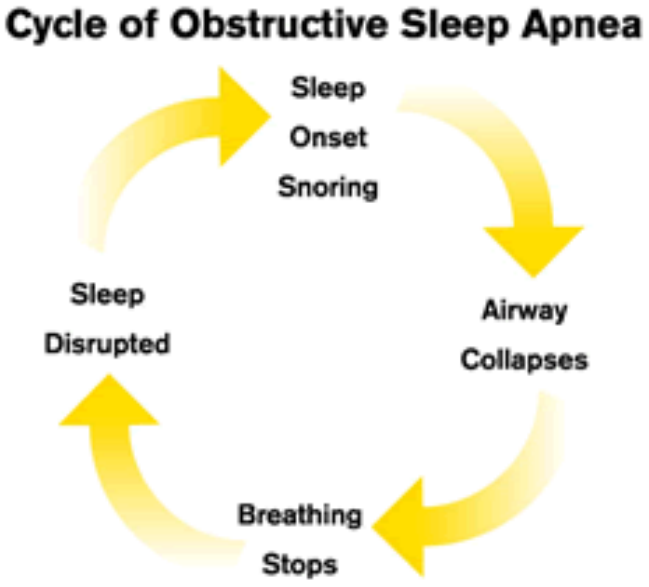
Background

"…The one area that needs immediate attention is [Commuter Rail's] fatigue management program, which does not contain an effective Obstructive Sleep Apnea (OSA) screening program; however, their management is diligently pursuing this goal." – Safety Review Panel Report

What is Obstructive Sleep Apnea (OSA)?

Sleep apnea is a potentially serious but highly treatable sleep disorder. **It causes breathing to repeatedly stop and start during sleep.** There are several types of sleep apnea, but the most common is obstructive sleep apnea, which occurs when throat muscles intermittently relax and block the airway during sleep. This can lead to:

- Hypertension
- Heart disease
- Mood/memory problems
- Drowsiness/daytime sleepiness
- Loss of concentration



Obstructive Sleep Apnea and Railroad Safety

Metro North: Spuyten Duyvil Derailment

- December 1, 2013 7:19AM
- Commuter train derailed in a curve while traveling 82 MPH in a 30 MPH zone
- 4 killed, 61 injured, $9 million in damages
- Investigation pointed to undiagnosed Obstructive Sleep Apnea in the Locomotive Engineer as the likely cause of error
- NTSB Report **faulted the railroad for not screening engineers for sleep disorders**, as well as the FRA for not having regulations requiring sleep disorder screening

New Jersey Transit: Hoboken Train Crash

- September 29, 2016 8:45AM
- Commuter train entered Hoboken Terminal and crashed into a bunter at the end of the track at 21 MPH
- 1 killed, 116 injured, $6 million in damages
- Investigation pointed to undiagnosed Obstructive Sleep Apnea in the Locomotive Engineer as the likely cause of error
- NTSB Report **faulted the railroad for not having a stringent sleep disorder screening program** (although they did have one), as well as the FRA for not having regulations requiring sleep disorder screening

Commuter Rail Employee Fatigue Management Program

- To minimize these risks and improve employee health and wellness, MBTA Commuter Rail has implemented a fatigue management program to screen for Obstructive Sleep Apnea
- Programs are strongly encouraged by National Transportation Safety Board and the Federal Railroad Administration, however **no formal regulation or guidance exists**
- Program design began in September 2019 as a **partnership between the FRA, MBTA, and Keolis** and was modeled on the fatigue management programs of other passenger railroads, including **Amtrak, New Jersey Transit, and Long Island Railroad**
- The program will **screen all Locomotive Engineers by the end of Q1** with the goal of expanding the program to **all safety-sensitive employees**, starting with Conductors

Program Components

- All Locomotive Engineers will be assessed on site in 2020 Q1 by a medical practitioner (company MRO) to determine if they may have sleep apnea.
  - Those considered at risk will be referred for specialist follow-up and potential sleep study.
  - Those diagnosed will have to demonstrate treatment compliance and fitness for duty.
  - Screenings will be incorporated into engineer training program and on-going medical reviews.
  - Screenings will also include a blood test to check for diabetes.
- Based on peer railroad experience, it is anticipated that **around 40% of Locomotive Engineers may require some form of treatment.**

Additional Safety Precautions

1. **Identification and designation of high-risk locations** where speed changes of 20 MPH or more exist
   - Requires communication between Engineer and Conductor, including radio communications when departing stations prior to speed restrictions
2. **Coordination between Engineer and Conductor** when approaching dead-end stations/terminals
   - Sign/countersign system in which Conductor will activate emergency brake valve if no response from engineer
3. **Internal test and observation program** focuses inspections at these critical locations to ensure compliance with the operating rules in place
4. **Locomotive Engineer and Conductor simulator training**
   - Introduction of intense scenario-based training
   - A dedicated training team follows Locomotive Engineers through training and out on the system
5. **Inward/outward-facing cameras**
   - Not a regulatory requirement
   - Camera technology is now a specification for all new equipment purchases and overhauls
   - 40 HSP-46 locomotives are currently equipped with outward-facing cameras and will be equipped with inward-facing systems by end of 2020
6. **Positive Train Control**
   - Defines approach speeds where speed restrictions exist and will apply brakes if the engineer fails to operate train within speed thresholds
   - Currently being installed across the CR network