National Transportation Safety Board

Human Performance

Dr. Stephen M. Jenner

Crew Performance

Crew had ample opportunity to slow and stop their train

Last signal before the accident:

Clearly visible

Crew allowed their train speed to increase

Standing MOW train:

Highly conspicuous

Striking train crew made no effort to slow or stop

Crew Work Schedules & Fatigue

Each crewmember's start time often varied by 2 to 10 hours on consecutive days

Conductor's start times		Engineer's start times	
April 7:	2:16 p.m.	April 8:	12:40 a.m.
April 8:	10:15 p.m.	April 9:	2:00 p.m.
April 9:	4:40 p.m.	April 10:	9:21 a.m.

Staff found that the crewmembers' irregular work schedules contributed to their fatigue

Medical Factors & Fatigue

Engineer	High Body Mass Index (BMI)
	High Blood Pressure (BP)
	Type 2 diabetes
Conductor	High BMI
	Difficulty controlling High BP
	Restless Legs Syndrome
	Insomnia

Staff found that both crewmembers were at risk for Obstructive Sleep Apnea (OSA)

Staff Finding

Based on the conductor's and the engineer's, irregular work schedules, medical conditions, and their lack of action before the collision, both crewmembers had fallen asleep due to fatigue.

Rail Safety Improvement Act

Congress enacted this Act following September 12, 2008, head-on collision between a passenger train and a freight train in Chatsworth, California

Risk reduction programs required, including methods to manage and reduce fatigue

- Fatigue educational programs, medical conditions, and crew scheduling

Fatigue Educational Programs

Require employee education programs

BNSF has a web-based fatigue training program

- Less than 2% of BNSF transportation employees have taken course
- Self assessment for sleep disorders

Medical Conditions and Fatigue

RSAC Medical Standards working group underway since 2006

Revised medical form (health history) to include questions about sleep disorders and other conditions

FRA to produce guidelines for industry

Scheduling and Fatigue

NTSB has recommended use of scientifically based principles when creating work schedules

Biomathematical models of fatigue recently introduced to rail industry

- Developed to evaluate the risk of fatigue associated with work schedules
- Effectiveness of these models should be evaluated as part of a railroad's risk reduction program

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