



**NTSB** National Transportation Safety Board

---

*Office of Railroad, Pipeline &  
Hazardous Materials Investigations*

## **DCA-08-MR-003**

Collision of Amtrak Train 371 and  
Norfolk Southern Railway Company  
Freight Train 23M

Chicago, Illinois

November 30, 2007



AMTRAK



8

SUD

HYUNDAI



# Launch Team

Steve Jenner

Dana Sanzo

Jim Remines

Richard Hipskind

Dave Watson

Ed Dobranetski

Debra Hall

Keith Holloway

Ted Turpin

Robert L. Sumwalt

Human Performance

Survival Factors and  
Emergency Response

Operations

Track and Engineering

Mechanical

Signals

Transportation Disaster  
Assistance

Public Affairs

IIC

Member

NTSB



# Support Staff

Cassandra Johnson

Vehicle Recorder

Frank Zakar

Materials Laboratory

Joseph Scott

Editor

Robert Turner

Graphics



# Parties

National Railroad Passenger Corporation

Norfolk Southern Railway Company

Federal Railroad Administration

Illinois Commerce Commission

United Transportation Union

Brotherhood of Locomotive Engineers and  
Trainmen

# Amtrak Train No. 371

- Train 371 originated from Grand Rapids, Michigan, 27 minutes late
- The train encountered other delays
- Amtrak called a relief crew
- The relief crew boarded at Hammond, Indiana, about 10:45 a.m.
- The engineer opted to continue operating the train



Norfolk Southern  
Train 23M

Accident MP 517.34

Amtrak Train 371



MP  
518

MP  
517

Track 2

Metra

Metra

Englewood  
Interlocking

Red over Yellow

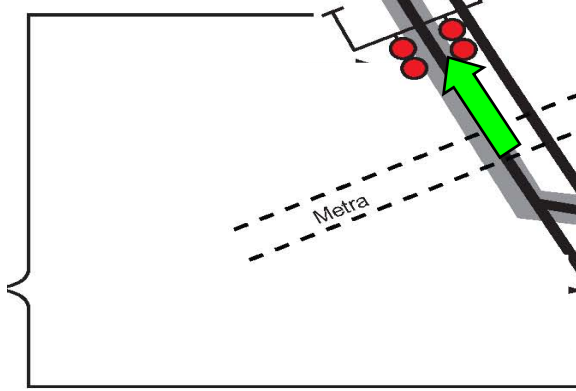
Track 1

Track 1

Amtrak Train  
371

NOT TO SCALE

Stopped Freight Train



# Injuries

- 187 triaged at the scene
  - 182 passengers
  - 5 crew members
- 71 transported to hospitals
- 3 admitted
  - 2 passengers
  - 1 crew member



# Safety Issues

- Crewmember communication and action in response to operating concerns.
- Wayside signal indication training and proficiency programs.
- Inadequate locomotive cab emergency egress and rescue access.



**NTSB**



# Safety Issue

Crewmember communication and action  
in response to operating concerns.

# Engineer Called the Signal

- When the engineer saw the red over yellow signal, he called it *slow approach*
- The signal was actually a *restricting* signal
- The relief engineer thought he may have “just called it wrong” and waited to see “what he was going to do”



# The Restricting Signal

- The *restricting* signal required the engineer to operate
  - Prepared to stop in one-half the range of vision expecting the track beyond the restricting signal to be occupied
  - Not exceeding 15 mph

# The Slow Approach

- The *slow approach* signal required the engineer to operate the train
  - Prepared to stop short of the next signal
  - Not exceeding 30 mph
- Not expecting a train



# Delayed Challenge by the Relief Engineer

- Train was moving slowly – the crew engaged in a job-related discussion
- About 2 1/2 minutes after crossing over to track 2, the train accelerated to more than 40 mph
- The relief engineer became uneasy

# Relief Engineer Spoke Up

- The relief engineer said, “if you called the signal slow approach shouldn’t you at least be going 30 mph?”
- About 70 seconds before the collision
- The engineer did not slow the train
- Only took action once the standing train was observed



# **NORAC Rule 94**

## **Responsibilities of Employees: Signals and Restrictions**

- Employees must communicate when a signal becomes clearly visible
- If a train is not operated in accordance with the requirements you must communicate with the engineer immediately
- If necessary, the employee must stop the train

# Conclusion

The engineer misinterpreted and miscalled the signal at Englewood which resulted in the operation of the Amtrak train at a speed greater than authorized, and when challenged by the relief engineer, the engineer failed to slow or stop the train while he and the relief engineer discussed their differences in understanding the signal displayed at Englewood.



# Conclusion

The relief engineer failed to communicate effectively and in a timely manner to the engineer that he had miscalled the restricting signal at Englewood interlocking and failed to then take action herself to stop the train after the engineer did not slow or stop the train when challenged.

# Multiple Signal Systems

- Operate over several railroads and must be proficient on more than one signal system
- Crews could be confused by the different signal systems



# Fundamental Conditions

- Title 49 CFR Part 236
  - Red light must indicate Stop
  - Green light must indicate Proceed
  - Yellow light or lunar light must indicate Restricted and Stop May Be Required

# Adjoining Railroads

- Same aspects
- Different meanings



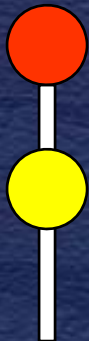
# Different Signal Indications

- Norfolk Southern - *Restricting*



- Be prepared to stop in one-half the range of vision
- Expect the track to be occupied

- Amtrak Terminal - *Slow Approach*



- Stop at the next signal
- Expect a clear track

# Conclusion

The lack of uniform meanings of signal aspects can lead to misinterpretation, as demonstrated by this accident.





**NTSB**