



National Transportation Safety Board

Collision of Amtrak Train No. 91 with Stationary
CSX Train F 777 03
Cayce, South Carolina
February 4, 2018

Richard Hipskind, Investigator-In-Charge

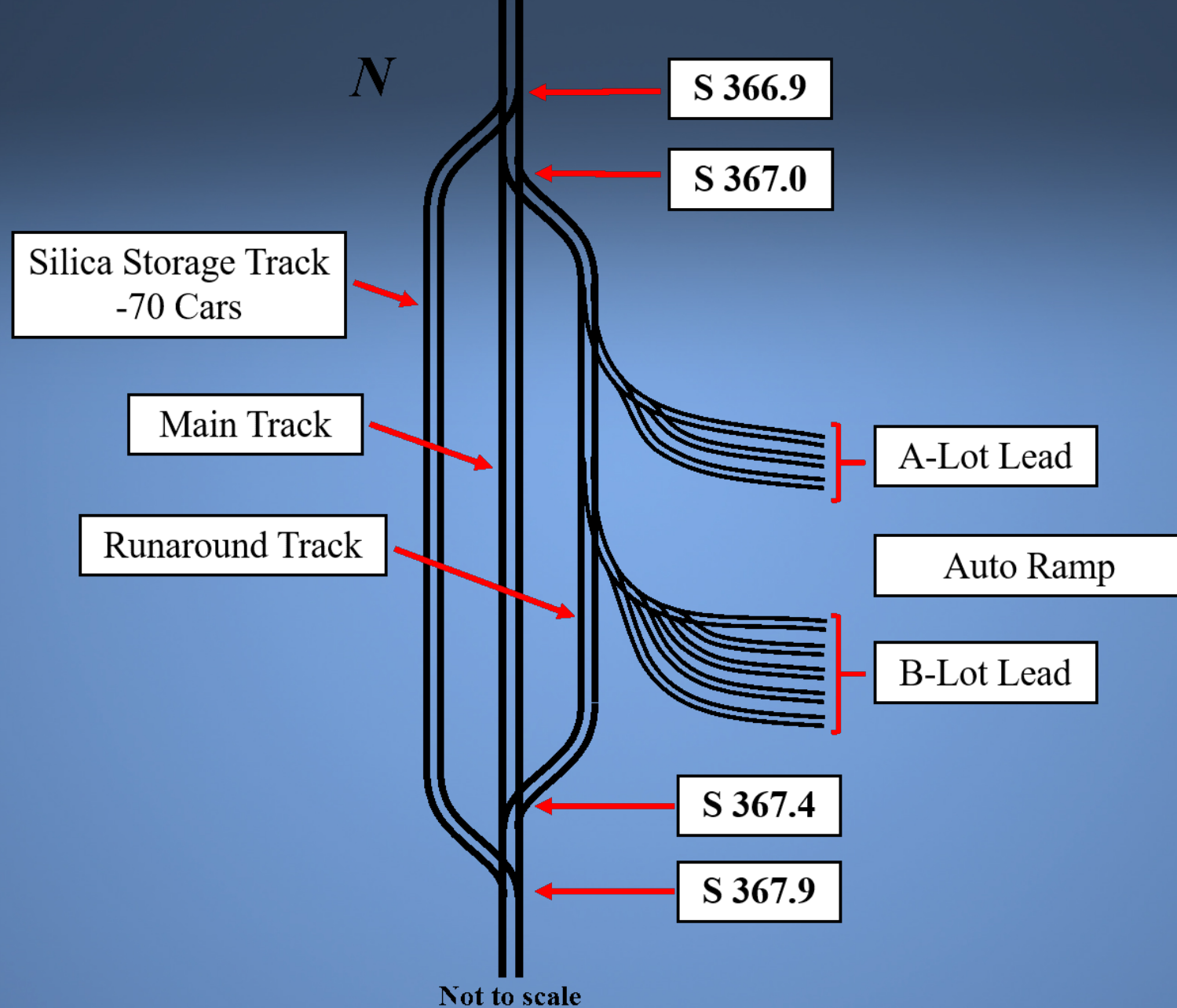


Approximately 660' from
switch to
point of collision

North

Direction of Travel

North end Silica
Siding Switch



Casualties

- Two fatalities
- Ninety-two transported to local hospitals
- Seventy-four injured; nine serious

Postaccident Actions

- On February 15, 2018, NTSB issued an Urgent Safety Recommendation to the FRA
- On March 4, 2018, Amtrak revised its operating procedures on all host railroads
- On March 7, 2018, CSX changed its signal suspension planning and operating procedures

Investigation Team

- R. A. Hipskind – IIC
- Jim Southworth – Asst. IIC
- Tomas Torres – Operations
- Dr. Michael Hoepf – Human Performance/System Safety
- Michael Hiller – Mechanical
- Joe Gordon – Track
- Ricky Page (Retired)
- Ruben Payan – Signals
- Dr. Mary Pat McKay – Medical
- Dana Sanzo –
Crashworthiness
- Sean Payne – Recorders

Staff

- David Bucher
- Dr. Robert Beaton
- Mike Hamilton
- Jeff Marcus
- Ivan Cheung
- Christy Spangler
- Ben Allen
- Pam Alesky
- Joe Scott
- Chris Wallace
- James Anderson
- Keith Holloway
- Eric Weiss
- Cyndi Lake
- Kimberly Frierson
- Troy Lloyd
- Rolando Garcia
- Response Operation Center

Parties to the Investigation

- Federal Railroad Administration
- South Carolina Office of Regulatory Staff
- National Railroad Passenger Corporation (Amtrak)
- CSX Transportation
- Brotherhood of Locomotive Engineers and Trainmen
- International Association of Sheet Metal, Air, Rail and Transportation Workers
- Brotherhood of Railroad Signalmen

Safety Issues

- Operations during signal suspensions
- Train crew handling switches
- CSX efficiency testing program and staffing
- Implementation of Safety Management Systems
- Occupant protection in passenger railcars
- Medical examination for railroad employees



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Suspension of Signal & Train Control System

Ruben Payan

CSX – Columbia Subdivision

- Divided into 8 track segments
- Track segments 1 through 6 were completed
- Track segment 7 in progress at time of accident
- Affected about 23 miles

CSX Temporary Signal Suspension

- Effective at 8:00 a.m. on Saturday, February 3, 2018
- Alternate method of operation using track warrants
- Scheduled to last for 2 days
- Trains into signal suspension limits totaled about 6 hours
- Signal system tests delayed

FRA Regulatory Requirements

- Changes requiring filing of application
 - Application for modifications of signal systems associated with PTC implementation (49 CFR §235.6)
- Interference with normal functioning of signal devices (49 CFR §236.4)
 - Measures to provide for safety of train operation which depends on normal functioning of device



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Operations

Tomas Torres

Operational Factors

- Signal suspension
- Train crews
- Switch position briefing
- Operational testing

CSX Signal Suspension

- Changed the operating environment
- Signal system not operational
- Trains governed by verbal authority
- Communication is critical

Train Crews

- CSX crew
- Amtrak crew

Switch Position Verification

- Crew did not accurately complete a Switch Position Awareness Form (SPAF)
- Conductor reported the switches were lined for the main track
- Crew did not verify the position of the switch

CSX Operational Tests

- Limited oversight by local management
- Lack of efficiency testing on main track operations

CSX Postaccident Actions

- Increased operational tests
- Bulletin for hand operated switches
- Signal suspension operating plan



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Human Performance & System Safety

Mike Hoepf, Ph.D.

CSX – Conductor Error of Omission

- Omissions likely to occur when task:
 - Repeated
 - Near the end of a task sequence
 - Lacking in conspicuity
 - Alternative operating procedures

Misaligned Switch Accidents

- Cotulla, Texas – 1974
- Graniteville, South Carolina - 2005
- Shepard, Texas - 2005
- Bettendorf, Iowa - 2009
- Roswell, New Mexico - 2015
- Granger, Wyoming – 2016



Ruptured Chlorine Tank Car,
Graniteville, South Carolina

FRA – Mitigation of Misaligned Switches

- Relies on administrative controls
- Insists NTSB recommendations are too costly
- Data shows leading cause of accidents



CSX Locomotive,
Cayce, South Carolina - 2018

Amtrak – Accidents Off-Property



Northfield,
Vermont – 2015



Cimarron,
Kansas – 2016



DuPont,
Washington – 2017

Amtrak – Followed Host Railroad Rules

- 97 percent of route-miles Amtrak operates are owned by other railroads
- “Amtrak shall be governed by and subject to all then current operating and safety rules, orders, procedures and standards of CSX”

Amtrak – Lack of Risk Management Off-Property

- Selection of a rulebook does not constitute a safety management system
- No risk assessments of host rules
- Varying levels of risk depending on location

Amtrak – Postaccident

- Questioned the policy of following the rules of the host railroads without first conducting risk assessments
- New processes to manage risk for trains operating off-property
- Working to improve safety culture



CSX – Safety Management System Needed

- Misaligned switches are a known risk
- Administrative controls ineffective
- Insufficient risk management

FRA - Delays System Safety

System Safety Program regulation - 49 *CFR* Part 270

- On August 12, 2016, the Federal Railroad Administration published a final rule
- Would improve passenger safety by advancing system safety standards in the industry
- Delayed for years



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