





**National Transportation Safety Board**

# Accident Train

- 61 Passengers
- 12 Amtrak employees
- 1 Fatality
- 3 Serious injuries
- 43 Minor injuries



# Launch Team

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# Flora Investigation

- Focused on:
  - Canadian National's Track Maintenance
  - Federal Railroad Administration's Oversight of Railroad's Track Maintenance
  - Amtrak's Emergency Preparation
- More than 4,000 man-hours



# Parties

- Federal Railroad Administration
- Canadian National Railway Company
- Amtrak
- Madison County Sheriff
- United Transportation Union
- Brotherhood of Locomotive Engineers and Trainmen





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# Safety Issue

- Canadian National Railway Company's continuous welded rail maintenance and inspection procedures and standards.



# Safety Issue

- Amtrak's emergency response training of its employees.



# Safety Issue

- The Federal Railroad Administration's oversight of continuous welded rail maintenance programs and Amtrak's emergency response training of its employees.





# Track Related Safety Issues

- Track conditions at the accident site
- Maintenance history
- Federal Railroad Administration's inspection and oversight







# Track Buckle Prevention

- Rail and track must be restrained
- Control rail temperature to prevent excessive expansion or contraction



# Preferred Rail Laying Temperature

- Selection of a preferred rail laying temperature
- Maintaining continuous welded rail to the preferred rail laying temperature
- Preferred Rail Laying Temperature: 105° F





NTSB



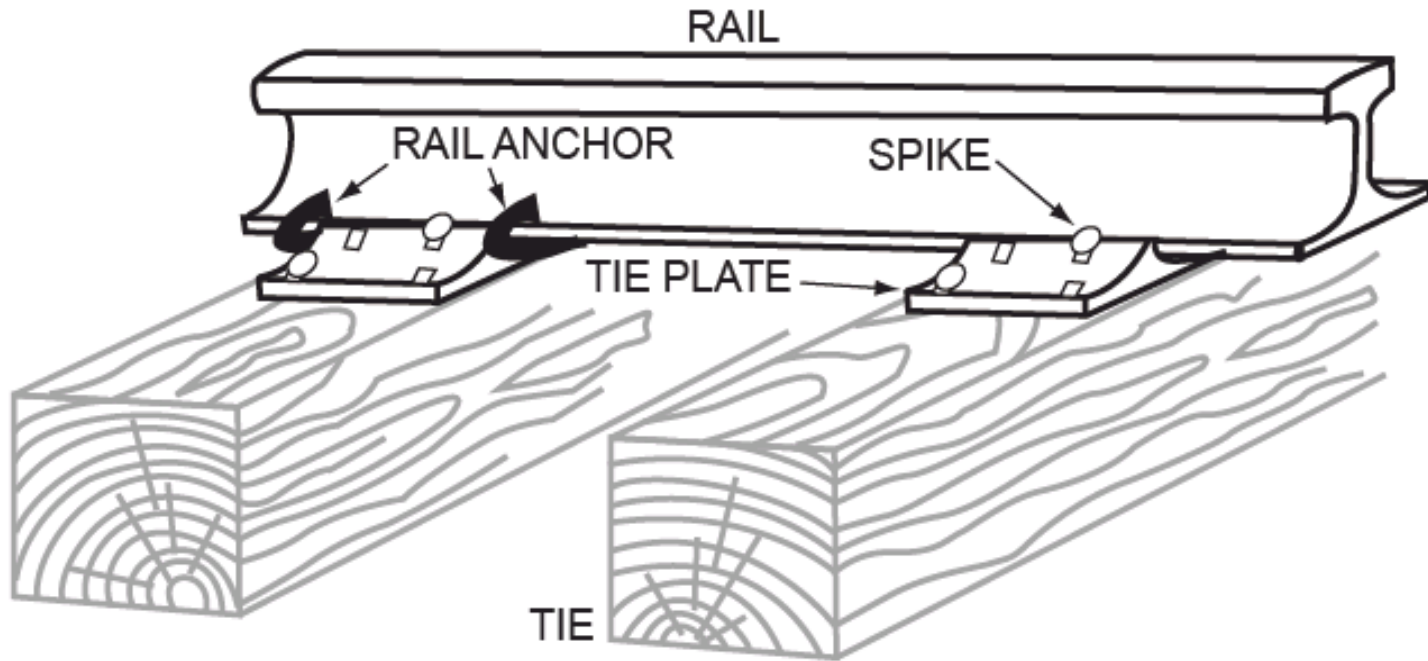
# Track Conditions

- Marginal crossties north and south of the rail plug
- Missing rail anchors and loose fasteners
- Rail anchor movement

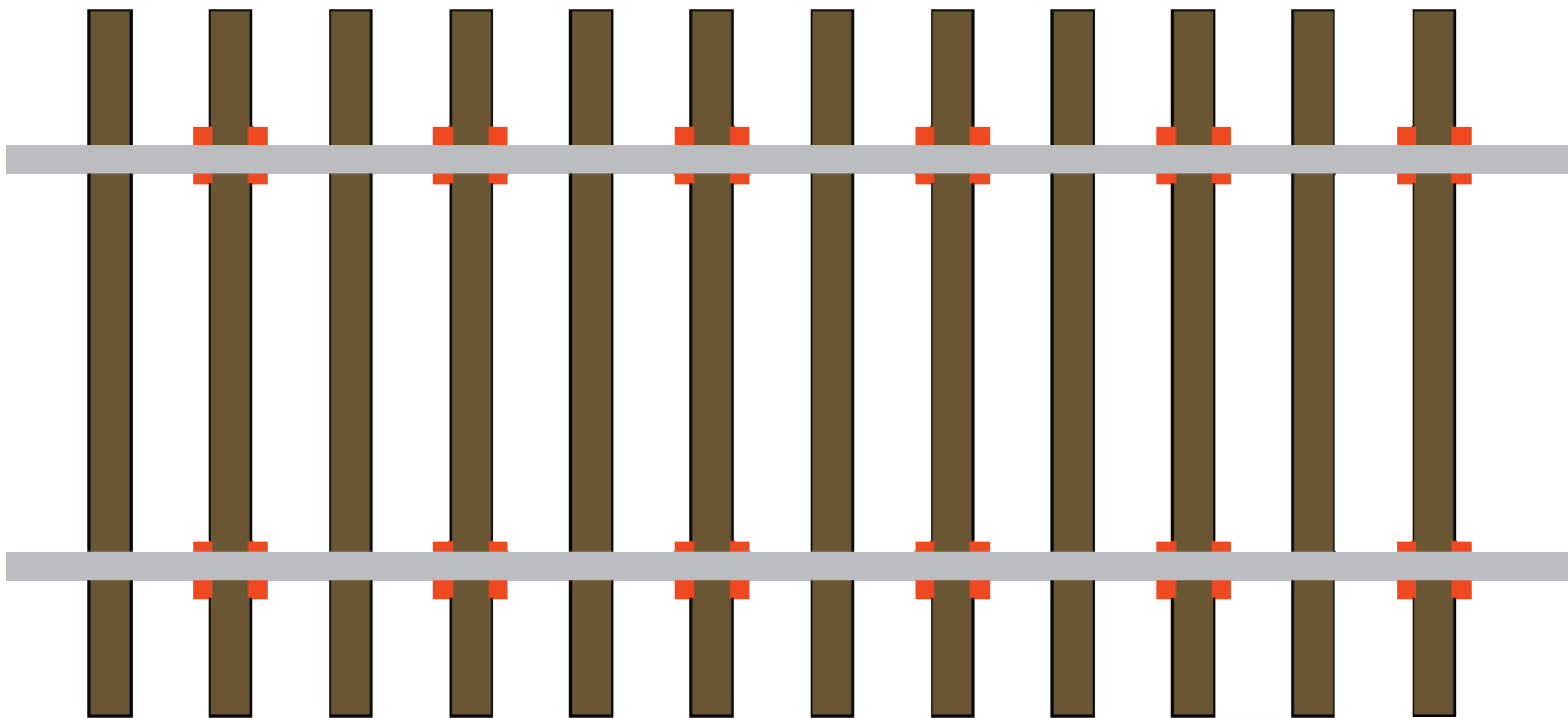




# Longitudinal Rail Movement







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# Postaccident Investigation

- 281 ties surveyed
- 50% of anchors ineffective or missing
- Lack of longitudinal rail restraint



# Conclusion

The inadequately restrained east rail lifted out of the tie plates because of expansion caused by warm temperatures resulting in the rail shifting and the gage widening, causing the wheels of the train to drop between the rails.



# Maintenance History

- January 29, 2004
  - Rail section cut out and replaced
  - Non-compliance work report



# Maintenance History

- Actual rail temperature 60° F
- Preferred rail laying temperature 105° F
- Rail pulled apart when cut



# Maintenance History

- Do not add rail length to continuous welded rail if practicable
- If rail length must be added, adjust before the onset of warm weather
- 2 ½ inches of rail added



# Maintenance History

- Work crew reported that the anchor pattern was to standard
- Postaccident investigation found 50% of anchors not to standard





# 2004 Maintenance History

- January 29 - rail replaced by CN welder
- March 6 - CN track inspector
- March 9 & 10 - CN track foreman
- March 16 - CN track supervisor



# Conclusion

Although the Canadian National Railway Company had written instructions for maintaining continuous welded rail and preventing track buckling, track employees at multiple levels did not follow or ensure adherence to these instructions.



# Conclusion

Had the employees who maintained the track at the accident site followed the written procedures the rail shift condition likely would not have occurred.





# Federal Railroad Administration Continuous Welded Rail Regulations

- Written procedures for continuous welded rail installation and rail adjustment
- Requirements for rail anchoring and fastening that will provide sufficient restraint



# FRA Options for Addressing Track Problems

- Note a defect for repair and file a violation
- Note a defect for repair
- Write a comment to the railroad



# Federal Railroad Administration Preaccident Inspection Activity

- June 2003 - “numerous locations tie distribution is marginal, rail anchors are ineffective against longitudinal displacement”
- February 2004 - No continuous welded rail concerns identified



# Federal Railroad Administration Postaccident Inspection Activity

- Hy-rail and walking track inspections
- Canadian National Railway Company cited for:
  - Failure to comply with procedures
  - Lack of rail anchors





# Conclusion

Although the Federal Railroad Administration's preaccident inspections identified track deficiencies, the Federal Railroad Administration's oversight was not effective in ensuring corrective action by the Canadian National Railway Company.





# Safety Issue

Amtrak's emergency response training of its employees.



# FRA Regulations

- Passenger railroads to have an emergency preparedness plan
- Initial and refresher training for employees every two years



# Amtrak's PREPARE Course

- Passenger evacuation procedures
- Type and location of emergency equipment
- First aid



# Flora Investigation

- Training records for the 12 employees reviewed
- 1 employee had not attended a PREPARE course
- 3 employees exceeded 2 years without refresher course



# Recommendation to Amtrak

- Implement effective controls to monitor and ensure that all train crews and on-board service personnel receive the necessary initial and recurrent emergency training to provide for passenger safety.  
(R-98-059)
- Closed – Acceptable Action



# Conclusion

- Amtrak is not assuring that all of its crewmembers receive emergency preparedness training.





# FRA Enforcement

- One audit of Amtrak's emergency preparedness training records
- About 40% of the employees did not have the training as required
- Two violations filed



# Conclusion

- The Federal Railroad Administration was not conducting periodic and extensive audits of Amtrak's passenger train emergency preparedness plan to ensure that all crewmembers were receiving the required emergency preparedness training.



