NTSB National Transportation Safety Board

Office of Railroad, Pipeline &
Hazardous Materials Investigations

Track & Structures

Postaccident Investigation

- Turnout, where the accident occurred, was deemed adequately lubricated
- Proper rail lubrication on standard No. 8 turnouts reduces the coefficient of friction as a train maneuvers through a turnout, reducing the potential for a wheel climb

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Rail Lubrication

WMATA memo dated October 25, 2005

- Track inspectors assess lubrication at all switches during routine track inspections
- Emphasizes proper lubrication at crossovers and turnouts to ensure safe single-tracking

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Rail Lubrication

- Single tracking can occur at any time
- Operating department personnel determine turnouts that will be utilized during single-track operations
- Track engineering department personnel are responsible for lubricating switches during each inspection
- Track engineering personnel are not automatically notified of single tracking

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Rail Lubrication

- As more trains are operated through the switches utilized in a single-tracking operation, the lubrication is depleted faster which could eventually lead to a “dry rail” condition

- A “dry rail” condition increases the coefficient of friction between the wheels and rails and the potential for a wheel climb derailment

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Rail Lubrication

- SOP: “Rail and Switch Lubrication, Wayside and Manual Application”
- Track Maintenance Procedure No. 3: Rail and Switch Lubrication, Wayside and Manual Application

Neither document addresses the need for interdepartmental communication and coordination, and neither has been formally adopted or implemented

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Draft Conclusion

Although rail lubrication was not a factor in this accident, because a lack of rail lubrication can significantly increase the potential for wheel climb derailments, comprehensive rail lubrication procedures are needed that take into account both operational and track engineering demands.

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5000-Series Derailment History

- WMATA experienced 7 yard derailments, beginning in 2003
  - Involving empty trains
  - Traveling at low speeds
  - Traversing unguarded No. 8 turnouts or curves with a radius of less than 500 feet
- Some involved cars with recently trued wheels

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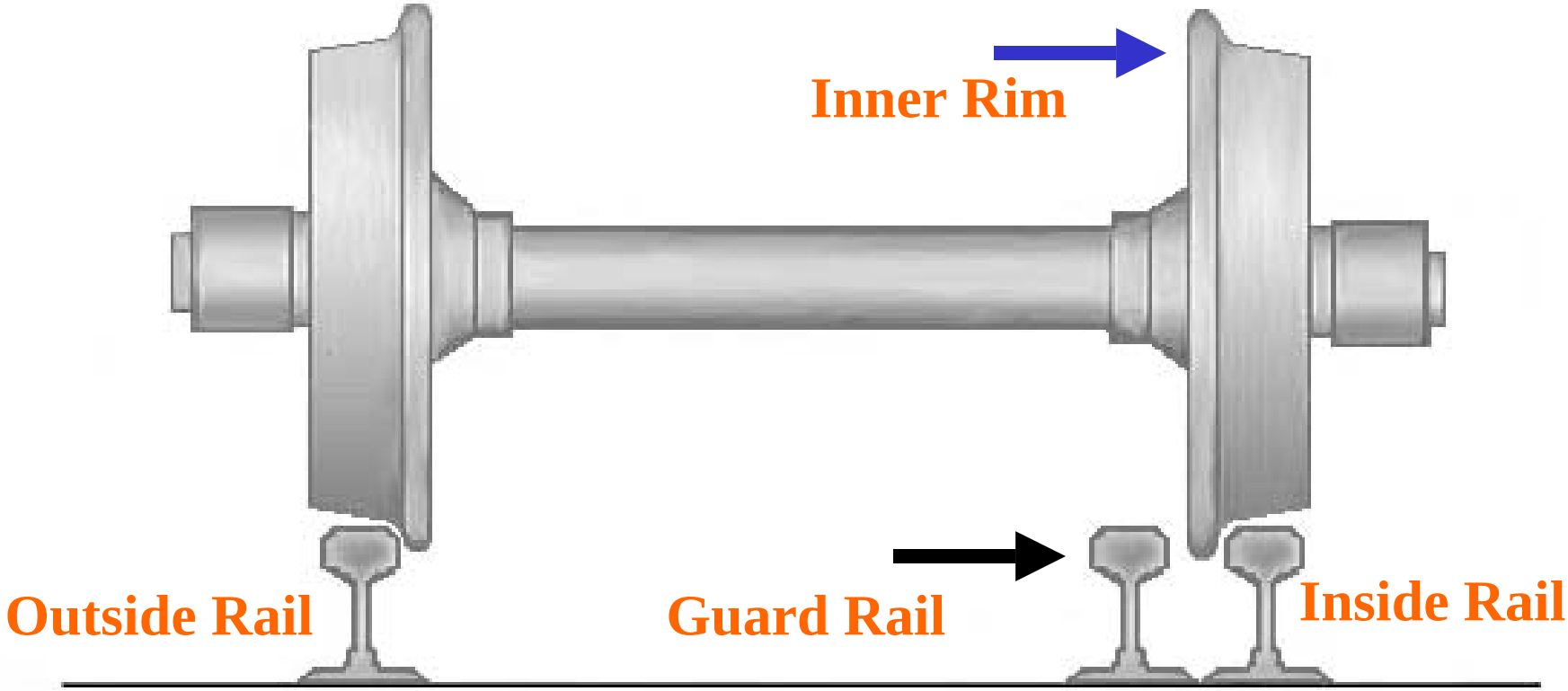
Inner Rim
Outside Rail
Guard Rail
Inside Rail

Draft Conclusion

Had a guarded turnout been installed, it would have prevented the wheel climb and derailment of the fifth car as the accident train traversed the curved track.

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