



Memorandum

DATE: October 10, 2023

TO: Robert Hall, Director
Office of Railroad, Pipeline and Hazardous Materials Investigations

FROM: Zach Zagata, IIC

SUBJECT: Accident Investigation Closeout Memo
RRD23LR009
Train derailment with release of hazardous materials
BNSF Railway
Raymond, Minnesota
March 30, 2023

SYNOPSIS

On March 30, 2023, about 12:58 a.m. local time, northbound BNSF Railway local freight train L-TWI8801-29I derailed on the Marshall District at Milepost 11.871 in Raymond, MN due to a catastrophic in-service rail failure (broken rail). Post-accident inspections and evidence obtained indicate that track-train dynamics worsened a rail head surface condition until a complete sectional break out of the rail head occurred underneath the L-TWI8801-29I. The derailment resulted in approximately 23 mixed freight rail cars, lines 9-21 to derail on their sides, and rail cars lines 22-32 to derail in an accordion style near the point of derailment. There were 14 loaded hazardous materials cars throughout the train with 10 cars involved in the derailment containing ethanol. A precautionary 1/2-mile evacuation radius affecting about 800 residents was implemented by the Incident Commander based on information ascertained from the Emergency Response Guidebook (ERG). There were no reported fatalities or injuries.

DOT 117 TANK CAR DESIGN AND VULNERABILITY

On-scene tank car inspections were completed on April 1, 2023, and preliminary findings show that hazardous material releases occurred from five breached tank cars. Two of these derailed tank cars sustained punctured shells that released ethanol, which ignited and destroyed manway gaskets of three additional tank cars and led to the further release of hazardous materials and spreading fire. The thermally damaged manway closures had been sealed with elastomeric butadiene acrylonitrile gaskets that, according to the manufacturer data, had upper temperature performance of 225 °F. In NTSB investigation HMD22LR001 similar issues were identified, and insufficiency

of tank car thermal protection system design and thermal performance regulations and standards for gaskets used in tank car service equipment are being addressed. In the final report for NTSB investigation HMD22LR001, the NTSB is issuing 7 new safety recommendations: 2 to the FRA, 3 to PHMSA, and 2 to the AAR.

CONCLUSION

As a result of the physical evidence, NTSB staff has determined that the in-service rail failure (broken rail) that caused this accident was related to a rail head surface condition. The transportation safety issues related to the DOT 117 tank car design and vulnerability issues identified are currently being addressed in NTSB investigation HMD22LR001 and no additional recommendations are warranted. Therefore, NTSB staff recommends that this investigation be closed.

I concur:



10-10-2023

Robert Hall
Director
Office of Railroad, Pipeline and Hazardous Materials Investigations

Date