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DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

Safety Advisory 2023-04; High-Impact Wheels Causing Damage to Rails and Track Structures.

AGENCY: Federal Railroad Administration (FRA), Department of Transportation (DOT).

ACTION: Notice of safety advisory.

SUMMARY: This Safety Advisory recommends railroads utilize Wheel Impact Load Detectors (WILD) to properly identify and replace high-impact railcar wheels that could cause significant damage to rails and supporting track structures. FRA's preliminary investigation of a recent train derailment in Gothenburg, Nebraska, indicates that high-impact wheels damaged the rail the train was operating over and caused the derailment. Current industry practices for using WILDs to identify and replace high-impact wheels could help prevent such incidents in the future.

FOR FURTHER INFORMATION CONTACT: Mr. Charles P. King, Director, Office of Railroad Infrastructure and Mechanical Equipment, at telephone: 202-329-5031 or email: Charles.King@dot.gov.

Disclaimer: This Safety Advisory is considered guidance pursuant to DOT Order 2100.6A (June 7, 2021). Except when referencing laws, regulations, policies, or orders, the information in this Safety Advisory does not have the force and effect of law and is

not meant to bind the public in any way. This document does not revise or replace any previously issued guidance.

SUPPLEMENTARY INFORMATION:

Background

In 2015, FRA issued Safety Advisory 2015-01 recommending, among other things, the use of WILDs to improve safety,¹ recognizing the potential value of these wayside detection systems, if they are appropriately installed, maintained, and utilized. FRA recommended railroads continue to install and maintain WILDs along certain routes and monitor their measurements to determine when to replace wheels. In that Safety Advisory, FRA also recommended that railroads lower the impact threshold for action to replace the wheels on any car in a high-hazard flammable train.

WILDs supplement, and do not substitute, the existing wheel regulations² that focus on preventing broken wheels and other wheel failures. WILD measurements are intended to focus more on the interaction between the wheels and the rail and prevent broken rails and other rail failures. WILDs are designed to measure the impact of a railcar's wheels on the rail and alert the operating railroad and car owner when wheels have a high impact. WILDs measure this impact on the rail in KIPs (1,000 pounds-force). High-impact wheels (generally considered to be more than 90 KIPs) are typically caused by a flat spot or other wheel defect. If not addressed, high-impact wheels can damage rail and track structures and cause a derailment.

¹ <https://railroads.dot.gov/elibrary/mechanical-inspections-and-wheel-impact-load-detector-standards-trains-transporting-large>.

² See e.g. 49 CFR 215.103, 229.73, 229.75.

On February 21, 2023, 30 freight cars carrying coal derailed in a train in Gothenburg, Nebraska. FRA's preliminary investigation indicates the derailment was likely caused by high-impact wheels breaking a track joint bar. Records from FRA's investigation show one of the freight cars had a WILD measurement of 130.6 KIPs when it operated over the track joint bar that was found broken. Records also show this freight car continued to operate for several months prior to the derailment after its high-impact wheels were identified by WILDs. WILD measurements showed high-impact wheels in November and December 2022, and again in January 2023. During its investigation, FRA also identified eight other freight cars in the derailed train with high-impact wheels.

Recommendations

In light of the Gothenburg, Nebraska, accident, FRA recommends railroads and contractors continue to use WILDs to help identify and replace high-impact wheels according to railroad current industry practices. Specifically, wheels with a WILD measurement greater than 80 KIPs should be replaced when in a repair shop, and wheels with a WILD measurement greater than 90 KIPs should be replaced when found in any other location in service. In addition, railroads should review procedures for identifying dynamic ratios to help predict high-impact wheels when cars are loaded. A dynamic ratio is the ratio of a WILD measurement of a loaded railcar compared to when it is empty. The peak impact is the highest WILD measurement recorded. The impact measurement varies during operation due to the changing operating environment, including changes in speed. Wheels should be replaced when an empty railcar with a dynamic ratio of 5 or higher has a preceding peak impact greater than 100 KIPs. Replacement at such time will reduce or eliminate further damage to the freight car's wheels, rails, and track structures. In addition,

FRA recommends railroads and contractors review this Safety Advisory with employees to increase their awareness of the possible consequences of allowing freight cars with high-impact wheels to continue to operate.

Conclusion

FRA encourages all railroad industry members to take actions consistent with the recommendations of this Safety Advisory. FRA may modify this Safety Advisory, issue additional safety advisories, or take other appropriate action necessary to ensure the highest level of safety on the Nation's railroads, including pursuing other corrective measures under its rail safety authority.

Issued in Washington, D.C.



Amitabha Bose,

Administrator.