



U.S. Department
of Transportation

**Federal Railroad
Administration**

Memorandum

Date: **SEP 11 2014**

Subject: Safety Guidance on Title 49 Code of Federal Regulations Section 213.103, Ballast; General

From: Ron Hynes
Director, Office of Technical Oversight

To: All Regional Administrators

Attached is Track Safety Standards Technical Bulletin T-14-01. The bulletin addresses issues pertaining to the application of Title 49 Code of Federal Regulations Section 213.103, *Ballast; general*. This document provides additional clarity and guidance for inspectors when examining track for ballast defects.

Please distribute to Regional Management, Track Specialists, Chief Inspectors, Track Inspectors/Trainees, and State Track Inspectors within your regions. It will also be posted on the Federal Railroad Administration's Web site.

If there are any questions concerning this Technical Bulletin, please contact Mr. Kenneth Rusk, Staff Director, Track Division, at (202) 493-6236 or Kenneth.Rusk@dot.gov.

Attachment

Federal Railroad Administration

Track Safety Technical Bulletin T-14-01
Title 49 Code of Federal Regulations Part 213

Background

The Federal Railroad Administration (FRA) received several inquiries concerning the proper application of Title 49 Code of Federal Regulations (CFR) Section 213.103, *Ballast; general*. The FRA Track and Rail and Infrastructure Integrity Compliance Manual (compliance manual) dated January 2014, provides the most recent guidance on the application of this section. See Volume II, Chapter 1 (Track Safety Standards Classes 1–5), page 5.13. In light of the recent questions, FRA reviewed the guidance and is issuing this technical bulletin to provide additional clarification and explanation of the guidance until the compliance manual is next updated and republished.

For ease of reference, this technical bulletin is formatted in a style similar to the current compliance manual.

§ 213.103 *Ballast; general*

Unless it is otherwise structurally supported, all track shall be supported by material which will—

103(a) Transmit and distribute the load of the track and railroad rolling equipment to the subgrade;

103(b) Restrain the track laterally, longitudinally, and vertically under dynamic loads imposed by railroad rolling equipment and thermal stresses imposed by the rails;

103(c) Provide adequate drainage for the track; and

103(d) Maintain proper track cross level, surface, and alinement.

Guidance: Ballast may consist of crushed slag, crushed stone, screened gravel, pit-run gravel, chat, cinders, scoria, pumice, sand, mine waste, or other native material, and is an integral part of the track structure. Ballast, regardless of the material, must satisfy all four of the requirements stated in the Track Safety Standards (TSS) for this section.

The sole appearance of fouled ballast (ballast contaminated with broken down ballast particles, mud, coal dust, or any foreign particles) does not warrant a defect or violation to be written, if the ballast section is properly transmitting the load, restraining the track, providing adequate drainage, and maintaining proper geometry. However, fouled ballast that is unable to provide adequate drainage, as required by paragraph (c) of this section, is of particular concern because it compromises the ability of ballast to meet its other three functions (i.e., to distribute load, restrain track, and maintain proper geometry). When fouled ballast with inadequate drainage is present, wheel loads are likely to be concentrated, rather than distributed, causing deterioration of components and instability in the area of the defective ballast. This deterioration of components and instability increases the risk of track shift (such as a track buckle) and also

increases the rate of degradation of geometry, and may result in a derailment. Other factors that affect the rate of degradation of components and geometry include the tonnage, traffic density, and operating speeds, as higher tonnage, traffic density, and operating speeds increase the amount and/or frequency of the forces exerted on the components.

Inspectors should consider the overall condition of a track when citing a ballast defect or violation (including fouled ballast or other failure modes that render the ballast unable to perform any one of its four functions). In doing so, inspectors should look for indicators that the ballast is not performing its four functions, such as the existence of a cross-tie and/or geometry condition. For example, a ballast violation may be warranted if the track has poor drainage and there is a geometry condition or a series of fouled ballast locations with geometry conditions.

The inspector should also consider the safety and risk issues when considering whether to recommend enforcement action. As such, the inspector should not typically issue a defect or violation in FRA Class 1 track or other than main track with speeds of 10 mph or less unless there is a significant risk of derailment with the potential for catastrophic consequence (e.g., a fouled ballast location with a significant geometry condition on a higher-tonnage passenger train or hazardous materials route). In such situations, any enforcement action should be taken in consultation with the inspector's regional specialist.

The term "geometry condition" used here and elsewhere in this manual means a track surface, gage, or alignment irregularity that does not exceed the allowable threshold for the designated track class in the TSS. It exists due to the reduced or nonexistent capability of one or more components of the track structure to hold the track to its preferred geometric position.

Inspectors are encouraged to exercise their technical knowledge and professional experience in citing fouled ballast, and should take into account the severity of a geometry condition along with the following factors when considering enforcement action:

- Track class and operating speed
- Traffic density and wheel loads
- Adequacy of shoulder ballast and crib ballast
- Track type: passenger, hazardous materials, or STRACNET route
- Potential that the track may deteriorate very rapidly following heavy rains
- Center-bound cross-ties, if observable
- Rail and fastener conditions
- Subgrade condition
- Surrounding track structure (embankment or cut, obvious/observable variation of track stiffness of the left from right side of the track, and from the adjacent areas along the track)
- Proximity of the defective ballast locations to switches, joints, or bridges
- Existence of standing water or indications that water had been standing (as water sometimes gets trapped beneath the ties and may not be visible on the surface). Note: If the standing water appears to be due to obstructed drainage facilities, enforcement action may be more appropriate under 49 CFR § 213.33.