

## 49 CFR Part 213—Track Safety Standards

### Subpart A—General

#### §213.4 Excepted track.

A track owner may designate a segment of track as excepted track provided that -

(a) The segment is identified in the timetable, special instructions, general order, or other appropriate records which are available for inspection during regular business hours;

(b) The identified segment is not located within 30 feet of an adjacent track which can be subjected to simultaneous use at speeds in excess of 10 miles per hour;

(c) The identified segment is inspected in accordance with 213.233(c) and 213.235 at the frequency specified for Class 1 track;

(d) The identified segment of track is not located on a bridge including the track approaching the bridge for 100 feet on either side, or located on a public street or highway, if railroad cars containing commodities required to be placarded by the Hazardous Materials Regulations (49 CFR part 172), are moved over the track; and

(e) The railroad conducts operations on the identified segment under the following conditions:

(1) No train shall be operated at speeds in excess of 10 miles per hour;

(2) No occupied passenger train shall be operated;

(3) No freight train shall be operated that contains more than five cars required to be placarded by the Hazardous Materials Regulations (49 CFR part 172); and

(4) The gage on excepted track shall not be more than 4 feet 10 ¼ inches. This paragraph (e)(4) is applicable September 21, 1999.

(f) A track owner shall advise the appropriate FRA Regional Office at least 10 days prior to removal of a segment of track from excepted status.

[47 FR 39401, Sept. 7, 1982; 63 FR 33992, June 22, 1998]

#### §213.5 Responsibility for compliance.

(a) Except as provided in paragraph (b) of this section, any owner of track to which this part applies who knows or has notice that the track does not comply with the requirements of this part, shall -

(1) Bring the track into compliance;

(2) Halt operations over that track; or

(3) Operate under authority of a person designated under § 213.7(a), who has at least one year of supervisory experience in railroad track maintenance, subject to conditions set forth in this part.

(b) If an owner of track to which this part applies designates a segment of track as "excepted track" under the provisions of § 213.4, operations may continue over that track without complying with the provisions of subparts B, C, D, and E of this part, unless otherwise expressly stated.

(c) If an owner of track to which this part applies assigns responsibility for the track to another person (by lease or otherwise), written notification of the assignment shall be provided to the appropriate FRA Regional Office at least 30 days in advance of the assignment. The notification may be made by any party to that assignment, but shall be in writing and include the following -

(1) The name and address of the track owner;

(2) The name and address of the person to whom responsibility is assigned (assignee);

(3) A statement of the exact relationship between the track owner and the assignee;

(4) A precise identification of the track;

(5) A statement as to the competence and ability of the assignee to carry out the duties of the track owner under this part; and

(6) A statement signed by the assignee acknowledging the assignment to him of responsibility for purposes of compliance with this part.

(d) The Administrator may hold the track owner or the assignee or both responsible for compliance with this part and subject to penalties under § 213.15.

(e) A common carrier by railroad which is directed by the Surface Transportation Board to provide service over the track of another railroad under 49 U.S.C. 11123 is considered the owner of that track for the purposes of the application of this part during the period the directed service order remains in effect.

(f) When any person, including a contractor for a railroad or track owner, performs any function required by this part, that person is required to perform that function in accordance with this part.

[47 FR 39402, Sept. 7, 1982; 63 FR 33992, June 22,

**§213.7 Designation of qualified persons to supervise certain renewals and inspect track.**

(a) Each track owner to which this part applies shall designate qualified persons to supervise restorations and renewals of track under traffic conditions. Each person designated shall have -

(1) At least-

(i) 1 year of supervisory experience in railroad track maintenance; or

(ii) A combination of supervisory experience in track maintenance and training from a course in track maintenance or from a college level educational program related to track maintenance;

(2) Demonstrated to the owner that he or she -

(i) Knows and understands the requirements of this part;

(ii) Can detect deviations from those requirements; and

(iii) Can prescribe appropriate remedial action to correct or safely compensate for those deviations; and

(3) Written authorization from the track owner to prescribe remedial actions to correct or safely compensate for deviations from the requirements in this part.

(b) Each track owner to which this part applies shall designate qualified persons to inspect track for defects. Each person designated shall have -

(1) At least -

(i) 1 year of experience in railroad track inspection; or

(ii) A combination of experience in track inspection and training from a course in track inspection or from a college level educational program related to track inspection;

(2) Demonstrated to the owner that he or she -

(i) Knows and understands the requirements of this part;

(ii) Can detect deviations from those requirements; and

(iii) Can prescribe appropriate remedial action to correct or safely compensate for those deviations; and

(3) Written authorization from the track owner to prescribe remedial actions to correct or safely compensate for deviations from the requirements of this part, pending review by a qualified person designated under paragraph (a) of this section.

(c) Persons not fully qualified to supervise certain renewals and inspect track as outlined in paragraphs (a) and (b) of this section, but with at least one year of maintenance-of-way or signal experience, may pass trains over broken rails and pull aparts provided that -

(1) The track owner determines the person to be qualified and, as part of doing so, trains, examines, and re-examines the person periodically within two years after each prior examination on the following topics as they relate to the safe passage of trains over broken rails or pull aparts: rail defect identification, crosstie condition, track surface and alinement, gage restraint, rail end mismatch, joint bars, and maximum distance between rail ends over which trains may be allowed to pass. The sole purpose of the examination is to ascertain the person's ability to effectively apply these requirements and the examination may not be used to disqualify the person from other duties. A minimum of four hours training is adequate for initial training;

(2) The person deems it safe and train speeds are limited to a maximum of 10 m.p.h. over the broken rail or pull apart;

(3) The person shall watch all movements over the broken rail or pull apart and be prepared to stop the train if necessary; and

(4) Person(s) fully qualified under § 213.7 of this part are notified and dispatched to the location promptly for the purpose of authorizing movements and effecting temporary or permanent repairs.

(d) With respect to designations under paragraphs (a), (b), and (c) of this section, each track owner shall maintain written records of -

(1) Each designation in effect;

(2) The basis for each designation; and

(3) Track inspections made by each designated qualified person as required by § 213.241. These records shall be kept available for inspection or copying by the Federal Railroad Administration during regular business hours.

[36 FR 20336, Oct. 20, 1971, as amended at 38 FR 875, Jan. 5, 1973; 63 FR 33992, June 22, 1998]

### **§213.17 Waivers.**

(a) Any owner of track to which this part applies, or other person subject to this part, may petition the Federal Railroad Administrator for a waiver from any or all requirements prescribed in this part. The filing of such a petition does not affect that person's

responsibility for compliance with that requirement while the petition is being considered.

(b) Each petition for a waiver under this section shall be filed in the manner and contain the information required by part 211 of this chapter.

(c) If the Administrator finds that a waiver is in the public interest and is consistent with railroad safety, the Administrator may grant the exemption subject to any conditions the Administrator deems necessary. Where a waiver is granted, the Administrator publishes a notice containing the reasons for granting the waiver.

[36 FR 20336, Oct. 20, 1971, as amended at 48 FR 35883, Aug. 8

### **Subpart C—Track Geometry**

#### **§213.57 Curves; elevation and speed limitations.**

(a) The maximum crosslevel on the outside rail of a curve may not be more than 8 inches on track Classes 1 and 2 and 7 inches on Classes 3 through 5. Except as provided in § 213.63, the outside rail of a curve may not be lower than the inside rail. (The first sentence of paragraph (a) is applicable September 21, 1999.)

(b) --  
213.57(b)(1)

(1) The maximum allowable operating speed for each curve is determined by the following formula -

Where -

$V_{max}$  = Maximum allowable operating speed (miles per hour).

$E_a$  = Actual elevation of the outside rail (inches).<sup>1</sup>

$D$  = Degree of curvature (degrees).<sup>2</sup>

(2) Table 1 of Appendix A is a table of maximum allowable operating speed computed in accordance with this formula for various elevations and degrees of curvature.

(c) --

(1) For rolling stock meeting the requirements specified in paragraph (d) of this section, the maximum operating speed for each curve may be determined by the following formula -

Where -

$V_{max}$  = Maximum allowable operating speed (miles per hour).

Ea = Actual elevation of the outside rail (inches).<sup>1</sup>

D = Degree of curvature (degrees).<sup>2</sup>

(2) Table 2 of Appendix A is a table of maximum allowable operating speed computed in accordance with this formula for various elevations and degrees of curvature.

(d) Qualified equipment may be operated at curving speeds determined by the formula in paragraph (c) of this section, provided each specific class of equipment is approved for operation by the Federal Railroad Administration and the railroad demonstrates that:

(1) When positioned on a track with a uniform 4-inch superelevation, the roll angle between the floor of the equipment and the horizontal does not exceed 5.7 degrees; and

(2) When positioned on a track with a uniform 6 inch superelevation, no wheel of the equipment unloads to a value of 60 percent of its static value on perfectly level track, and the roll angle between the floor of the equipment and the horizontal does not exceed 8.6 degrees.

(3) The track owner shall notify the Federal Railroad Administrator no less than 30 calendar days prior to the proposed implementation of the higher curving speeds allowed under the formula in paragraph (c) of this section. The notification shall be in writing and shall contain, at a minimum, the following information -

(i) A complete description of the class of equipment involved, including schematic diagrams of the suspension systems and the location of the center of gravity above top of rail;

(ii) A complete description of the test procedure<sup>3</sup> and instrumentation used to qualify the equipment and the maximum values for wheel unloading and roll angles which were observed during testing;

(iii) Procedures or standards in effect which relate to the maintenance of the suspension system for the particular class of equipment; and

(iv) Identification of line segment on which the higher curving speeds are proposed to be implemented.

(e) A track owner, or an operator of a passenger or commuter service, who provides passenger or commuter service over trackage of more than one track owner with the same class of equipment may provide written notification to the Federal Railroad Administrator with the written consent of the other affected track owners.

(f) Equipment presently operating at curving speeds allowed under the formula in paragraph (c) of this section, by reason of conditional waivers granted by the Federal Railroad Administration, shall be considered to have successfully complied with the requirements of paragraph (d) of this section.

(g) A track owner or a railroad operating above Class 5 speeds, may request approval from the Federal Railroad Administrator to operate specified equipment at a level of cant deficiency greater than four inches in accordance with § 213.329(c) and (d) on curves in Class 1 through 5 track which are contiguous to the high speed track provided that -

(1) The track owner or railroad submits a test plan to the Federal Railroad Administrator for approval no less than thirty calendar days prior to any proposed implementation of the higher curving speeds. The test plan shall include an analysis and determination of carbody acceleration safety limits for each vehicle type which indicate wheel unloading of 60 percent in a steady state condition and 80 percent in a transient (point by point) condition. Accelerometers shall be laterally-oriented and floor-mounted near the end of a representative vehicle of each type;

(2) Upon FRA approval of a test plan, the track owner or railroad conducts incrementally increasing train speed test runs over the curves in the identified track segment(s) to demonstrate that wheel unloading is within the limits prescribed in paragraph (g)(1) of this section;

(3) Upon FRA approval of a cant deficiency level, the track owner or railroad inspects the curves in the identified track segment with a Track Geometry Measurement System (TGMS) qualified in accordance with § 213.333(b) through (g) at an inspection frequency of at least twice annually with not less than 120 days interval between inspections; and

(4) The track owner or railroad operates an instrumented car having dynamic response characteristics that are representative of other equipment assigned to service or a portable device that monitors on-board instrumentation on trains over the curves in the identified track segment at the revenue speed profile at a frequency of at least once every 90-day period with not less than 30 days interval between inspections. The instrumented car or the portable device shall monitor a laterally-oriented accelerometer placed near the end of the vehicle at the floor level. If the carbody lateral acceleration measurement exceeds the safety limits prescribed in paragraph (g)(1), the railroad shall operate trains at curving speeds in accordance with paragraph (b) or (c) of this section; and

(5) The track owner or railroad shall maintain a copy of the most recent exception printouts for the inspections required under paragraphs (g)(3) and (4) of this section. [63 FR 33992, June 22, 1998; 63 FR 54078, October 08, 1998]

## **Subpart D—Track Structure**

### **§213.110 Gage restraint measurement systems.**

(a) A track owner may elect to implement a Gage Restraint Measurement System (GRMS), supplemented by the use of a Portable Track Loading Fixture (PTLF), to determine compliance with the crosstie and fastener requirements specified in §§ 213.109 and 213.127 provided that -

(1) The track owner notifies the appropriate FRA Regional office at least 30 days prior to the designation of any line segment on which GRMS technology will be implemented; and

(2) The track owner notifies the appropriate FRA Regional office at least 10 days prior to the removal of any line segment from GRMS designation.

(b) Initial notification under paragraph (a)(1) of this section shall include -

(1) Identification of the line segment(s) by timetable designation, milepost limits, class of track, or other identifying criteria; and

(2) The most recent record of million gross tons of traffic per year over the identified segment(s).

(c) The track owner shall also provide to FRA sufficient technical data to establish compliance with the minimum design requirements of a GRMS vehicle which specify that -

(1) Gage restraint shall be measured between the heads of rail -

(A) At an interval not exceeding 16 inches;

(B) Under an applied vertical load of no less than 10,000 pounds per rail; and

(C) Under an applied lateral load which provides for a lateral/vertical load ratio between 0.5 and 1.25, and a load severity greater than 3,000 pounds but less than 8,000 pounds.

(d) Load severity is defined by the formula -  $S=L-cV$

Where -

S=Load severity, defined as the lateral load applied to the fastener system (pounds).

L=Actual lateral load applied (pounds).

c=Coefficient of friction between rail/tie which is assigned a nominal value of (0.4).

V=Actual vertical load applied (pounds).

213.110(e)

(e) The measured gage values shall be converted to a Projected Loaded Gage 24 (PLG 24) as follows -

Where -

UTG=Unloaded track gage measured by the GRMS vehicle at a point no less than 10 feet from any lateral or vertical load application.

LTG=Loaded track gage measured by the GRMS vehicle at a point no more than 12 inches from the lateral load application point.

A=The extrapolation factor used to convert the measured loaded gage to expected loaded gage under a 24,000 pound lateral load and a 33,000 pound vertical load.

For all track -



Note: The A factor shall not exceed (3.184) under any valid loading configuration.  
where -

L=Actual lateral load applied (pounds).

V=Actual vertical load applied (pounds).

(f) The measured gage value shall be converted to a Gage Widening Ratio (GWR) as follows -

(g) The GRMS vehicle shall be capable of producing output reports that provide a trace, on a constant-distance scale, of all parameters specified in paragraph (l) of this section.

(h) The GRMS vehicle shall be capable of providing an exception report containing a systematic listing of all exceptions, by magnitude and location, to all the parameters specified in paragraph (l) of this section.

(i) The exception reports required by this section shall be provided to the appropriate person designated as fully qualified under § 213.7 prior to the next inspection required under § 213.233.

(j) The track owner shall institute the necessary procedures for maintaining the integrity of the data collected by the GRMS and PTLF systems. At a minimum, the track owner shall -

(1) Maintain and make available to the Federal Railroad Administration documented calibration procedures on each GRMS vehicle which, at a minimum, shall specify a daily instrument verification procedure that will ensure correlation between measurements made on the ground and those recorded by the instrumentation with respect to loaded and unloaded gage parameters; and

(2) Maintain each PTLF used for determining compliance with the requirements of this section such that the 4,000-pound reading is accurate to within five percent of that reading.

(k) The track owner shall provide training in GRMS technology to all persons designated as fully qualified under § 213.7 and whose territories are subject to the requirements of this section. The training program shall be made available to the Federal Railroad Administration upon request. At a minimum, the training program shall address -

(1) Basic GRMS procedures;

(2) Interpretation and handling of exception reports generated by the GRMS vehicle;

(3) Locating and verifying defects in the field;

(4) Remedial action requirements;

(5) Use and calibration of the PTLF; and

(6) Recordkeeping requirements.

(1) The GRMS record of lateral restraint shall identify two exception levels. At a minimum, the track owner shall initiate the required remedial action at each exception level as defined in the following table -

GRMS parameter	If measurement value exceeds	Remedial action required
First Level Exception		
UTG 58 inches		(1) Immediately protect the exception location with a 10 mph speed restriction; then verify location; and
		(2) Restore lateral restraint and maintain in compliance with PTLF criteria as described in paragraph (m) of this section; and
		(3) Maintain compliance with § 213.53(b) of this part as measured with the PTLF.
Second Level Exception		
LTG 57 ¾ inches		on Class 4 and 5 track 2 2 Limit operating speed to no more than the maximum allowable under § 213.9 for Class 3 track; then verify location; and
PLG2459 inches		(1) Maintain in compliance with PTLF criteria as described in paragraph (m) of this section; and
GWR 1.0 inches		(2) Maintain compliance with § 213.53(b) of this part as measured with the PTLF.
		PLG2458 inches
		GWR 0.75 inches

1 Definitions for the GRMS parameters referenced in this table are found in paragraph (p) of this section.

2 This note recognizes that typical good track will increase in total gage by as much as 1/4 inch due to outward rail rotation under GRMS loading conditions. For Class 2 & 3 track, the GRMS LTG values are also increased by 1/4 inch to a maximum of 58 inches. However, for any Class of track, GRMS LTG values in excess of 58 inches are considered First Level exceptions and the appropriate remedial actions must be taken by the track owner. This 1/4-inch increase in allowable gage applies only to GRMS LTG. For gage measured by traditional methods, or with the use of the PTLF, the table in §213.53(b) will apply.

(m) Between GRMS inspections, the PTLF may be used as an additional analytical tool to assist fully qualified § 213.7 individuals in determining compliance with the crosstie and fastener requirements of §§ 213.109 and 213.127. When the PTLF is used, whether as an additional analytical tool or to fulfill the requirements of paragraph (l), it shall be used subject to the following criteria -

(1) At any location along the track that the PTLF is applied, that location will be deemed in compliance with the cross-tie and fastener requirements specified in §§ 213.109 and 213.127 provided that -

(i) The total gage widening at that location does not exceed 5/8 inch when increasing the applied force from 0 to 4,000 pounds; and

(ii) The gage of the track under 4,000 pounds of applied force does not exceed the allowable gage prescribed in § 213.53(b) for the class of track.

(2) Gage widening in excess of 5/8 inch shall constitute a deviation from Class 1 standards.

(3) A person designated as fully qualified under § 213.7 retains the discretionary authority to prescribe additional remedial actions for those locations which comply with the requirements of paragraph (m)(1)(i) and (ii) of this section.

(4) When a functional PTLF is not available to a fully qualified person designated under § 213.7, the criteria for determining cross-tie and fastener compliance shall be based solely on the requirements specified in §§ 213.109 and 213.127.

(5) If the PTLF becomes non-functional or is missing, the track owner will replace or repair it before the next inspection required under § 213.233.

(6) Where vertical loading of the track is necessary for contact with the lateral rail restraint components, a PTLF test will not be considered valid until contact with these components is restored under static loading conditions.

(n) The track owner shall maintain a record of the two most recent GRMS inspections at locations which meet the requirements specified in § 213.241(b). At a minimum, records shall indicate the following -

(1) Location and nature of each First Level exception; and

(2) Nature and date of remedial action, if any, for each exception identified in paragraph (n)(1) of this section.

(o) The inspection interval for designated GRMS line segments shall be such that -

(1) On line segments where the annual tonnage exceeds two million gross tons, or where the maximum operating speeds for passenger trains exceeds 30 mph, GRMS inspections must be performed annually at an interval not to exceed 14 months; or

(2) On line segments where the annual tonnage is two million gross tons or less and the maximum operating speed for passenger trains does not exceed 30 mph, the interval between GRMS inspections must not exceed 24 months.

(p) As used in this section -

(1) Gage Restraint Measurement System (GRMS) means a track loading vehicle meeting the minimum design requirements specified in this section.

(2) Gage Widening Ratio (GWR) means the measured difference between loaded and unloaded gage measurements, linearly normalized to 16,000 pounds of applied lateral load.

(3) L/V ratio means the numerical ratio of lateral load applied at a point on the rail to the vertical load applied at that same point. GRMS design requirements specify an L/V ratio of between 0.5 and 1.25. GRMS vehicles using load combinations developing L/V ratios which exceed 0.8 must be operated with caution to protect against the risk of wheel climb by the test wheelset.

(4) Load severity means the amount of lateral load applied to the fastener system after friction between rail and tie is overcome by any applied gage-widening lateral load.

(5) Loaded Track Gage (LTG) means the gage measured by the GRMS vehicle at a point no more than 12 inches from the lateral load application point.

(6) Portable Track Loading Fixture (PTLF) means a portable track loading device capable of applying an increasing lateral force from 0 to 4,000 pounds on the web/base fillet of each rail simultaneously.

(7) Projected Loaded Gage (PLG) means an extrapolated value for loaded gage calculated from actual measured loads and deflections. PLG 24 means the extrapolated value for loaded gage under a 24,000 pound lateral load and a 33,000 pound vertical load.

(8) Unloaded Track Gage (UTG) means the gage measured by the GRMS vehicle at a point no less than 10 feet from any lateral or vertical load.

[66 FR 1894, January 10, 2001; 66 FR 8372, January 31, 2001]

### **§213.119 Continuous welded rail (CWR); general.**

Each track owner with track constructed of CWR shall have in effect and comply with a plan that contains written procedures which address: the installation, adjustment, maintenance and inspection of CWR; inspection of joints in CWR; and a training program for the application of those procedures. The plan shall be submitted to the Federal Railroad Administration by March 22, 1999. FRA reviews each plan for compliance with the following-

(a) Procedures for the installation and adjustment of CWR which include -

(1) Designation of a desired rail installation temperature range for the geographic area in which the CWR is located; and

(2) De-stressing procedures/methods which address proper attainment of the desired rail installation temperature range when adjusting CWR.

(b) Rail anchoring or fastening requirements that will provide sufficient restraint to limit longitudinal rail and crosstie movement to the extent practical, and specifically addressing CWR rail anchoring or fastening patterns on bridges, bridge approaches, and at other locations where possible longitudinal rail and crosstie movement associated with normally expected train-induced forces, is restricted.

(c) Procedures which specifically address maintaining a desired rail installation temperature range when cutting CWR including rail repairs, in-track welding, and in conjunction with adjustments made in the area of tight track, a track buckle, or a pull-apart. Rail repair practices shall take into consideration existing rail temperature so that -

(1) When rail is removed, the length installed shall be determined by taking into consideration the existing rail temperature and the desired rail installation temperature range; and

(2) Under no circumstances should rail be added when the rail temperature is below that designated by paragraph (a)(1) of this section, without provisions for later adjustment.

(d) Procedures which address the monitoring of CWR in curved track for inward shifts of alignment toward the center of the curve as a result of disturbed track.

(e) Procedures which control train speed on CWR track when -

(1) Maintenance work, track rehabilitation, track construction, or any other event occurs which disturbs the roadbed or ballast section and reduces the lateral or longitudinal resistance of the track; and

(2) In formulating the procedures under this paragraph (e), the track owner shall -

(i) Determine the speed required, and the duration and subsequent removal of any speed restriction based on the restoration of the ballast, along with sufficient ballast re-consolidation to stabilize the track to a level that can accommodate expected train-induced forces. Ballast re-consolidation can be achieved through either the passage of train tonnage or mechanical stabilization procedures, or both; and

(ii) Take into consideration the type of crossties used.

(f) Procedures which prescribe when physical track inspections are to be performed to detect buckling prone conditions in CWR track. At a minimum, these procedures shall address inspecting track to identify -

(1) Locations where tight or kinky rail conditions are likely to occur;

(2) Locations where track work of the nature described in paragraph (e)(1) of this section have recently been performed; and

(3) In formulating the procedures under this paragraph (f), the track owner shall -

(i) Specify the timing of the inspection; and

(ii) Specify the appropriate remedial actions to be taken when buckling prone conditions are found.

(g) Procedures which prescribe the scheduling and conduct of inspections to detect cracks and other indications of potential failures in CWR joints. On and after January 1, 2007, in formulating the procedures under this paragraph, the track owner shall-

(1) Address the inspection of joints and the track structure at joints, including, at a minimum, periodic on-foot inspections;

(2) Identify joint bars with visible or otherwise detectable cracks and conduct remedial action pursuant to § 213.121;

(3) Specify the conditions of actual or potential joint failure for which personnel must inspect, including, at a minimum, the following items:

(i) Loose, bent, or missing joint bolts;

(ii) Rail end batter or mismatch that contributes to instability of the joint; and

(iii) Evidence of excessive longitudinal rail movement in or near the joint, including, but not limited to; wide rail gap, defective joint bolts, disturbed ballast, surface deviations, gap between tie plates and rail, or displaced rail anchors;

(4) Specify the procedures for the inspection of CWR joints that are imbedded in highway-rail crossings or in other structures that prevent a complete inspection of the joint, including procedures for the removal from the joint of loose material or other temporary material;

(5) Specify the appropriate corrective actions to be taken when personnel find conditions of actual or potential joint failure, including on-foot follow-up inspections to monitor conditions of potential joint failure in any period prior to completion of repairs.

(6) Specify the timing of periodic inspections, which shall be based on the configuration and condition of the joint:

(i) Except as provided in paragraphs (g)(6)(ii) through (iv), track owners must specify that all CWR joints are inspected, at a minimum, in accordance with the intervals identified in the following table-

Minimum Number of Inspections Per Calendar Year 1

Freight trains operating over track with an annual tonnage of: Passenger trains operating over track with an annual tonnage of:

	Less than 40 mgt	40 to 60 mgt	Greater than 60 mgt	Less than 20 mgt	Greater than or equal to 20 mgt
Class 5 & above	2	2 3	2 4	2 3	2 3
Class 42	2 3	2 4	2	2 3	
Class 31	2	2	2	2	
Class 20	0	0	1	1	
Class 10	0	0	0	0	
Excepted Track	0	0	0	n/a	n/a

4 = Four times per calendar year, with one inspection in each of the following periods: January to March, April to June, July to September, and October to December; and with consecutive inspections separated by at least 60 calendar days.

3 = Three times per calendar year, with one inspection in each of the following periods: January to April, May to August, and September to December; and with consecutive inspections separated by at least 90 calendar days

2 = Twice per calendar year, with one inspection in each of the following periods: January to June and July to December; and with consecutive inspections separated by at least 120 calendar days.

1 = Once per calendar year, with consecutive inspections separated by at least 180 calendar days.

1 Where a track owner operates both freight and passenger trains over a given segment of track, and there are two different possible inspection interval requirements, the more frequent inspection interval applies.

2 When extreme weather conditions prevent a track owner from conducting an inspection of a particular territory within the required interval, the track owner may extend the interval by up to 30 calendar days from the last day that the extreme weather condition prevented the required inspection.

(ii) Consistent with any limitations applied by the track owner, a passenger train conducting an unscheduled detour operation may proceed over track not normally used for passenger operations at a speed not to exceed the maximum authorized speed otherwise allowed, even though CWR joints have not been inspected in accordance with the frequency identified in paragraph (g)(6)(i), provided that:

(A) All CWR joints have been inspected consistent with requirements for freight service; and

(B) The unscheduled detour operation lasts no more than 14 consecutive calendar days. In order to continue operations beyond the 14-day period, the track owner must inspect the CWR joints in accordance with the requirements of paragraph (g)(6)(i).

(iii) Tourist, scenic, historic, or excursion operations, if limited to the maximum authorized speed for passenger trains over the next lower class of track, need not be considered in determining the frequency of inspections under paragraph (g)(6)(i).

(iv) All CWR joints that are located in switches, turnouts, track crossings, lift rail assemblies or other transition devices on moveable bridges must be inspected on foot at least monthly, consistent with the requirements in § 213.235; and all records of those inspections must be kept in accordance with the requirements in § 213.241. A track owner may include in its § 213.235 inspections, in lieu of the joint inspections required by paragraph (g)(6)(i), CWR joints that are located in track structure that is adjacent to switches and turnouts, provided that the track owner precisely defines the parameters of that arrangement in the CWR plans.

(7) Specify the recordkeeping requirements related to joint bars in CWR, including the following:

(i) The track owner shall keep a record of each periodic and follow-up inspection required to be performed by the track owner's CWR plan, except for those inspections conducted pursuant to § 213.235 for which track owners must maintain records pursuant to § 213.241. The record shall be prepared on the day the inspection is made and signed by the person making the inspection. The record shall include, at a minimum, the following items: the boundaries of the territory inspected; the nature and location of any deviations at the joint from the requirements of this Part or of the track owner's CWR plan, with the location identified with sufficient precision that personnel could return to the joint and identify it without ambiguity; the date of the inspection; the remedial action, corrective action, or both, that has been taken or will be taken; and the name or identification number of the person who made the inspection.

(ii) The track owner shall generate a Fracture Report for every cracked or broken CWR joint bar that the track owner discovers during the course of an inspection conducted pursuant to §§ 213.119(g), § 213.233, or § 213.235 on track that is required under § 213.119(g)(6)(i) to be inspected.

(A) The Fracture Report shall be prepared on the day the cracked or broken joint bar is discovered. The record shall include, at a minimum: the railroad name; the location of the joint bar as identified by milepost and subdivision; the class of track; annual million gross tons for the previous calendar year; the date of discovery of the crack or break; the rail section; the type of bar (standard, insulated, or compromise); the number of holes in the joint bar; a general description of the location of the crack or break in bar; the visible length of the crack in inches; the gap measurement between rail ends; the amount and length of rail end batter or ramp on each rail end; the amount of tread mismatch; the vertical movement of joint; and in curves or spirals, the amount of gage mismatch and the lateral movement of the joint.

(B) The track owner shall submit the information contained in the Fracture Reports to the FRA Associate Administrator for Safety (Associate Administrator) twice annually, by



July 31 for the preceding six-month period from January 1 through June 30 and by January 31 for the preceding six-month period from July 1 through December 31.

(C) After February 1, 2010, any track owner may petition FRA to conduct a technical conference to review the Fracture Report data submitted through December of 2009 and assess whether there is a continued need for the collection of Fracture Report data. The track owner shall submit a written request to the Associate Administrator, requesting the technical conference and explaining the reasons for proposing to discontinue the collection of the data.

(8) In lieu of the requirements for the inspection of rail joints contained in paragraphs (g)(1) through (7) of this section, a track owner may seek approval from FRA to use alternate procedures.

(i) The track owner shall submit the proposed alternate procedures and a supporting statement of justification to the Associate Administrator for Safety (Associate Administrator).

(ii) If the Associate Administrator finds that the proposed alternate procedures provide an equivalent or higher level of safety than the requirements in paragraphs (g)(1) through (g)(7) of this section, the Associate Administrator will approve the alternate procedures by notifying the track owner in writing. The Associate Administrator will specify in the written notification the date on which the procedures will become effective, and after that date, the track owner shall comply with the procedures. If the Associate Administrator determines that the alternate procedures do not provide an equivalent level of safety, the Associate Administrator will disapprove the alternate procedures in writing, and the track owner shall continue to comply with the requirements in paragraphs (g)(1) through (7) of this section.

(iii) While a determination is pending with the Associate Administrator on a request submitted pursuant to paragraph (g)(8) of this section, the track owner shall continue to comply with the requirements contained in paragraphs (g)(1) through (7) of this section.

(h) The track owner shall have in effect a comprehensive training program for the application of these written CWR procedures, with provisions for periodic re-training, for those individuals designated under § 213.7 as qualified to supervise the installation, adjustment, and maintenance of CWR track and to perform inspections of CWR track.

(i) The track owner shall prescribe and comply with recordkeeping requirements necessary to provide an adequate history of track constructed with CWR. At a minimum, these records must include:

(1) Rail temperature, location and date of CWR installations. This record shall be retained for at least one year;

(2) A record of any CWR installation or maintenance work that does not conform with the written procedures. Such record shall include the location of the rail and be maintained until the CWR is brought into conformance with such procedures;

(3) Information on inspection of rail joints as specified in paragraph (g)(7) of this part. [63 FR 33992, June 22, 1998; 63 FR 46102, August 28, 1998; 70 FR 66297, Nov. 2, 2005; 71 FR 59693, Oct. 11, 2006]

### **§213.122 Torch cut rail.**

(a) Except as a temporary repair in emergency situations no rail having a torch cut end shall be used in Classes 3 through 5 track. When a rail end is torch cut in emergency situations, train speed over that rail end shall not exceed the maximum allowable for Class 2 track. For existing torch cut rail ends in Classes 3 through 5 track the following shall apply -

(1) Within one year of September 21, 1998, all torch cut rail ends in Class 5 track shall be removed;

(2) Within two years of September 21, 1998, all torch cut rail ends in Class 4 track shall be removed; and

(3) Within one year of September 21, 1998, all torch cut rail ends in Class 3 track over which regularly scheduled passenger trains operate, shall be inventoried by the track owner.

(b) Following the expiration of the time limits specified in paragraphs (a)(1), (2), and (3) of this section, any torch cut rail end not removed from Classes 4 and 5 track, or any torch cut rail end not inventoried in Class 3 track over which regularly scheduled passenger trains operate, shall be removed within 30 days of discovery. Train speed over that rail end shall not exceed the maximum allowable for Class 2 track until removed.  
[63 FR 33992, June 22, 1998]

### **Subpart F—Inspection**

#### **§213.233 Track inspections.**

(a) All track shall be inspected in accordance with the schedule prescribed in paragraph (c) of this section by a person designated under § 213.7.

(b) Each inspection shall be made on foot or by riding over the track in a vehicle at a speed that allows the person making the inspection to visually inspect the track structure for compliance with this part. However, mechanical, electrical, and other track inspection devices may be used to supplement visual inspection. If a vehicle is used for visual inspection, the speed of the vehicle may not be more than 5 miles per hour when passing over track crossings and turnouts, otherwise, the inspection vehicle speed shall be at the

sole discretion of the inspector, based on track conditions and inspection requirements. When riding over the track in a vehicle, the inspection will be subject to the following conditions -

(1) One inspector in a vehicle may inspect up to two tracks at one time provided that the inspector's visibility remains unobstructed by any cause and that the second track is not centered more than 30 feet from the track upon which the inspector is riding;

(2) Two inspectors in one vehicle may inspect up to four tracks at a time provided that the inspectors' visibility remains unobstructed by any cause and that each track being inspected is centered within 39 feet from the track upon which the inspectors are riding;

(3) Each main track is actually traversed by the vehicle or inspected on foot at least once every two weeks, and each siding is actually traversed by the vehicle or inspected on foot at least once every month. On high density commuter railroad lines where track time does not permit an on track vehicle inspection, and where track centers are 15 foot or less, the requirements of this paragraph (b)(3) will not apply; and

(4) Track inspection records shall indicate which track(s) are traversed by the vehicle or inspected on foot as outlined in paragraph (b)(3) of this section.

(c) Each track inspection shall be made in accordance with the following schedule -

Class of track	Type of track	Required frequency
Excepted track and Class 1, 2, and 3 track.	Main track and sidings.	Weekly with at least 3 calendar days interval between inspections, or before use, if the track is used less than once a week, or twice weekly with at least 1 calendar day interval between inspections, if the track carries passenger trains or more than 10 million gross tons of traffic during the preceding calendar year.
Excepted track and Class 1, 2, and 3 track.	Other than main track and sidings.	Monthly with at least 20 calendar days interval between inspections.
Class 4 and 5 track.		Twice weekly with at least 1 calendar day interval between inspections.

(d) If the person making the inspection finds a deviation from the requirements of this part, the inspector shall immediately initiate remedial action.

Note to § 213.233: Except as provided in paragraph (b) of this section, no part of this section will in any way be construed to limit the inspector's discretion as it involves inspection speed and sight distance.

[36 FR 20336, Oct. 20, 1971, as amended at 40 FR 8558, Feb. 28, 1975; 63 FR 33992, June 22, 1998]

### **§213.237 Inspection of rail.**

(a) In addition to the track inspections required by § 213.233, a continuous search for internal defects shall be made of all rail in Classes 4 through 5 track, and Class 3 track over which passenger trains operate, at least once every 40 million gross tons (mgt) or once a year, whichever interval is shorter. On Class 3 track over which passenger trains do not operate such a search shall be made at least once every 30 mgt or once a year, whichever interval is longer. (This paragraph (a) is applicable January 1, 1999.

(b) Inspection equipment shall be capable of detecting defects between joint bars, in the area enclosed by joint bars.

(c) Each defective rail shall be marked with a highly visible marking on both sides of the web and base.

(d) If the person assigned to operate the rail defect detection equipment being used determines that, due to rail surface conditions, a valid search for internal defects could not be made over a particular length of track, the test on that particular length of track cannot be considered as a search for internal defects under paragraph (a) of this section. (This paragraph (d) is not retroactive to tests performed prior to September 21, 1998.

(e) If a valid search for internal defects cannot be conducted for reasons described in paragraph (d) of this section, the track owner shall, before the expiration of time or tonnage limits -

(1) Conduct a valid search for internal defects;

(2) Reduce operating speed to a maximum of 25 miles per hour until such time as a valid search for internal defects can be made; or

(3) Remove the rail from service.

[36 FR 20336, Oct. 20, 1971, as amended at 38 FR 876, Jan. 5, 1973; 63 FR 33992, June 22, 1998]

### **§213.241 Inspection records.**

(a) Each owner of track to which this part applies shall keep a record of each inspection required to be performed on that track under this subpart.

(b) Each record of an inspection under §§ 213.4, 213.119, 213.233, and 213.235 shall be prepared on the day the inspection is made and signed by the person making the inspection. Records shall specify the track inspected, date of inspection, location and nature of any deviation from the requirements of this part, and the remedial action taken by the person making the inspection. The owner shall designate the location(s) where each original record shall be maintained for at least one year after the inspection covered by the record. The owner shall also designate one location, within 100 miles of each state

in which they conduct operations, where copies of records which apply to those operations are either maintained or can be viewed following 10 days notice by the Federal Railroad Administration.

(c) Rail inspection records shall specify the date of inspection, the location and nature of any internal defects found, the remedial action taken and the date thereof, and the location of any intervals of track not tested per § 213.237(d). The owner shall retain a rail inspection record for at least two years after the inspection and for one year after remedial action is taken.

(d) Each owner required to keep inspection records under this section shall make those records available for inspection and copying by the Federal Railroad Administration.

(e) For purposes of compliance with the requirements of this section, an owner of track may maintain and transfer records through electronic transmission, storage, and retrieval provided that -

(1) The electronic system be designed so that the integrity of each record is maintained through appropriate levels of security such as recognition of an electronic signature, or other means, which uniquely identify the initiating person as the author of that record. No two persons shall have the same electronic identity;

(2) The electronic storage of each record shall be initiated by the person making the inspection within 24 hours following the completion of that inspection;

(3) The electronic system shall ensure that each record cannot be modified in any way, or replaced, once the record is transmitted and stored;

(4) Any amendment to a record shall be electronically stored apart from the record which it amends. Each amendment to a record shall be uniquely identified as to the person making the amendment;

(5) The electronic system shall provide for the maintenance of inspection records as originally submitted without corruption or loss of data;

(6) Paper copies of electronic records and amendments to those records, that may be necessary to document compliance with this part shall be made available for inspection and copying by the Federal Railroad Administration at the locations specified in paragraph (b) of this section; and

(7) Track inspection records shall be kept available to persons who performed the inspections and to persons performing subsequent inspections.

[36 FR 20336, Oct. 20, 1971, as amended at 48 FR 35883, Aug. 8, 1983; 63 FR 33992, June 22, 1998; 70 FR 66298, Nov. 2, 2005]

Subpart G—Train Operations at Track Classes 6 and Higher

**§213.303 Responsibility for compliance.**

(a) Any owner of track to which this subpart applies who knows or has notice that the track does not comply with the requirements of this subpart, shall -

- (1) Bring the track into compliance; or
- (2) Halt operations over that track.

(b) If an owner of track to which this subpart applies assigns responsibility for the track to another person (by lease or otherwise), notification of the assignment shall be provided to the appropriate FRA Regional Office at least 30 days in advance of the assignment. The notification may be made by any party to that assignment, but shall be in writing and include the following -

- (1) The name and address of the track owner;
- (2) The name and address of the person to whom responsibility is assigned (assignee);
- (3) A statement of the exact relationship between the track owner and the assignee;
- (4) A precise identification of the track;
- (5) A statement as to the competence and ability of the assignee to carry out the duties of the track owner under this subpart;
- (6) A statement signed by the assignee acknowledging the assignment to that person of responsibility for purposes of compliance with this subpart.

(c) The Administrator may hold the track owner or the assignee or both responsible for compliance with this subpart and subject to the penalties under § 213.15.

(d) When any person, including a contractor for a railroad or track owner, performs any function required by this part, that person is required to perform that function in accordance with this part.

**§213.305 Designation of qualified individuals; general qualifications.**

Each track owner to which this subpart applies shall designate qualified individuals responsible for the maintenance and inspection of track in compliance with the safety requirements prescribed in this subpart. Each individual, including a contractor or an employee of a contractor who is not a railroad employee, designated to:

(a) Supervise restorations and renewals of track shall meet the following minimum requirements:

(1) At least;

(i) Five years of responsible supervisory experience in railroad track maintenance in track Class 4 or higher and the successful completion of a course offered by the employer or by a college level engineering program, supplemented by special on the job training emphasizing the techniques to be employed in the supervision, restoration, and renewal of high speed track; or

(ii) A combination of at least one year of responsible supervisory experience in track maintenance in Class 4 or higher and the successful completion of a minimum of 80 hours of specialized training in the maintenance of high speed track provided by the employer or by a college level engineering program, supplemented by special on the job training provided by the employer with emphasis on the maintenance of high speed track; or

(iii) A combination of at least two years of experience in track maintenance in track Class 4 or higher and the successful completion of a minimum of 120 hours of specialized training in the maintenance of high speed track provided by the employer or by a college level engineering program supplemented by special on the job training provided by the employer with emphasis on the maintenance of high speed track.

(2) Demonstrate to the track owner that the individual:

(i) Knows and understands the requirements of this subpart;

(ii) Can detect deviations from those requirements; and

(iii) Can prescribe appropriate remedial action to correct or safely compensate for those deviations; and

(3) Be authorized in writing by the track owner to prescribe remedial actions to correct or safely compensate for deviations from the requirements of this subpart and successful completion of a recorded examination on this subpart as part of the qualification process.

(b) Inspect track for defects shall meet the following minimum qualifications:

(1) At least:

(i) Five years of responsible experience inspecting track in Class 4 or above and the successful completion of a course offered by the employer or by a college level engineering program, supplemented by special on the job training emphasizing the techniques to be employed in the inspection of high speed track; or

(ii) A combination of at least one year of responsible experience in track inspection in Class 4 or above and the successful completion of a minimum of 80 hours of specialized training in the inspection of high speed track provided by the employer or by a college level engineering program, supplemented by special on the job training provided by the employer with emphasis on the inspection of high speed track; or

(iii) A combination of at least two years of experience in track maintenance in Class 4 or above and the successful completion of a minimum of 120 hours of specialized training in the inspection of high speed track provided by the employer or from a college level engineering program, supplemented by special on the job training provided by the employer with emphasis on the inspection of high speed track.

(2) Demonstrate to the track owner that the individual:

(i) Knows and understands the requirements of this subpart;

(ii) Can detect deviations from those requirements; and

(iii) Can prescribe appropriate remedial action to correct or safely compensate for those deviations; and (3) Be authorized in writing by the track owner to prescribe remedial actions to correct or safely compensate for deviations from the requirements in this subpart and successful completion of a recorded examination on this subpart as part of the qualification process.

(c) Individuals designated under paragraphs (a) or (b) of this section that inspect continuous welded rail (CWR) track or supervise the installation, adjustment, and maintenance of CWR in accordance with the written procedures established by the track owner shall have:

(1) Current qualifications under either paragraph (a) or (b) of this section;

(2) Successfully completed a training course of at least eight hours duration specifically developed for the application of written CWR procedures issued by the track owner; and

(3) Demonstrated to the track owner that the individual:

(i) Knows and understands the requirements of those written CWR procedures;

(ii) Can detect deviations from those requirements; and

(iii) Can prescribe appropriate remedial action to correct or safely compensate for those deviations; and

(4) Written authorization from the track owner to prescribe remedial actions to correct or safely compensate for deviations from the requirements in those procedures and successful completion of a recorded examination on those procedures as part of the



qualification process. The recorded examination may be written, or it may be a computer file with the results of an interactive training course.

(d) Persons not fully qualified to supervise certain renewals and inspect track as outlined in paragraphs (a), (b) and (c) of this section, but with at least one year of maintenance of way or signal experience, may pass trains over broken rails and pull aparts provided that -

(1) The track owner determines the person to be qualified and, as part of doing so, trains, examines, and re-examines the person periodically within two years after each prior examination on the following topics as they relate to the safe passage of trains over broken rails or pull aparts: rail defect identification, crosstie condition, track surface and alinement, gage restraint, rail end mismatch, joint bars, and maximum distance between rail ends over which trains may be allowed to pass. The sole purpose of the examination is to ascertain the person's ability to effectively apply these requirements and the examination may not be used to disqualify the person from other duties. A minimum of four hours training is adequate for initial training;

(2) The person deems it safe, and train speeds are limited to a maximum of 10 m.p.h. over the broken rail or pull apart;

(3) The person shall watch all movements over the broken rail or pull apart and be prepared to stop the train if necessary; and

(4) Person(s) fully qualified under § 213.305 of this subpart are notified and dispatched to the location as soon as practicable for the purpose of authorizing movements and effectuating temporary or permanent repairs.

(e) With respect to designations under paragraphs (a), (b), (c) and (d) of this section, each track owner shall maintain written records of:

(1) Each designation in effect;

(2) The basis for each designation, including but not limited to:

(i) The exact nature of any training courses attended and the dates thereof;

(ii) The manner in which the track owner has determined a successful completion of that training course, including test scores or other qualifying results;

(3) Track inspections made by each individual as required by § 213.369. These records shall be made available for inspection and copying by the Federal Railroad Administration during regular business hours.

[63 FR 45959, August 28, 1998]

**§213.317 Waivers.**

(a) Any owner of track to which this subpart applies may petition the Federal Railroad Administrator for a waiver from any or all requirements prescribed in this subpart.

(b) Each petition for a waiver under this section shall be filed in the manner and contain the information required by §§ 211.7 and 211.9 of this chapter.

(c) If the Administrator finds that a waiver is in the public interest and is consistent with railroad safety, the Administrator may grant the waiver subject to any conditions the Administrator deems necessary. Where a waiver is granted, the Administrator publishes a notice containing the reasons for granting the waiver.

**§213.329 Curves, elevation and speed limitations.**

(a) The maximum crosslevel on the outside rail of a curve may not be more than 7 inches. The outside rail of a curve may not be more than ½ inch lower than the inside rail.

(b) --

(1) The maximum allowable operating speed for each curve is determined by the following formula:

Where -

V<sub>max</sub> = Maximum allowable operating speed (miles per hour).

E<sub>a</sub> = Actual elevation of the outside rail (inches)4.

D = Degree of curvature (degrees)5.

3 = 3 inches of unbalance.

213.329(b)(2)

(2) Appendix A includes tables showing maximum allowable operating speeds computed in accordance with this formula for various elevations and degrees of curvature for track speeds greater than 90 m.p.h.

(c) For rolling stock meeting the requirements specified in paragraph (d) of this section, the maximum operating speed for each curve may be determined by the following formula:

Where -

V<sub>max</sub> = Maximum allowable operating speed (miles per hour).

E<sub>a</sub> = Actual elevation of the outside rail (inches) 4.

D = Degree of curvature (degrees) 5.

E<sub>u</sub> = Unbalanced elevation (inches).

(d) Qualified equipment may be operated at curving speeds determined by the formula in paragraph (c) of this section, provided each specific class of equipment is approved for operation by the Federal Railroad Administration and the railroad demonstrates that -

(1) When positioned on a track with uniform superelevation,  $E_a$ , reflecting the intended target cant deficiency,  $E_u$ , no wheel of the equipment unloads to a value of 60 percent or less of its static value on perfectly level track and, for passenger-carrying equipment, the roll angle between the floor of the vehicle and the horizontal does not exceed 5.7 degrees.

(2) When positioned on a track with a uniform 7-inch superelevation, no wheel unloads to a value less than 60% of its static value on perfectly level track and, for passenger-carrying equipment, the angle, measured about the roll axis, between the floor of the vehicle and the horizontal does not exceed 8.6 degrees.

(e) The track owner shall notify the Federal Railroad Administrator no less than thirty calendar days prior to any proposed implementation of the higher curving speeds allowed when the "Eu" term, above, will exceed three inches. This notification shall be in writing and shall contain, at a minimum, the following information:

(1) A complete description of the class of equipment involved, including schematic diagrams of the suspension system and the location of the center of gravity above top of rail;

(2) A complete description of the test procedure<sup>6</sup> and instrumentation used to qualify the equipment and the maximum values for wheel unloading and roll angles which were observed during testing;

(3) Procedures or standards in effect which relate to the maintenance of the suspension system for the particular class of equipment;

(4) Identification of line segment on which the higher curving speeds are proposed to be implemented.

(f) A track owner, or an operator of a passenger or commuter service, who provides passenger or commuter service over trackage of more than one track owner with the same class of equipment, may provide written notification to the Federal Railroad Administrator with the written consent of the other affected track owners.

[63 FR 33992, June 22, 1998]

### **§213.333 Automated vehicle inspection systems.**

(a) For track Class 7, a qualifying Track Geometry Measurement System (TGMS) vehicle shall be operated at least twice within 120 calendar days with not less than 30 days between inspections. For track Classes 8 and 9, it shall be operated at least twice within 60 days with not less than 15 days between inspections.

(b) A qualifying TGMS shall meet or exceed minimum design requirements which specify that -

(1) Track geometry measurements shall be taken no more than 3 feet away from the contact point of wheels carrying a vertical load of no less than 10,000 pounds per wheel;

(2) Track geometry measurements shall be taken and recorded on a distance-based sampling interval which shall not exceed 2 feet; and

(3) Calibration procedures and parameters are assigned to the system which assure that measured and recorded values accurately represent track conditions. Track geometry measurements recorded by the system shall not differ on repeated runs at the same site at the same speed more than 1/8 inch.

(c) A qualifying TGMS shall be capable of measuring and processing the necessary track geometry parameters, at an interval of no more than every 2 feet, which enables the system to determine compliance with: § 213.323, Track gage; § 213.327, Alinement; § 213.329, Curves; elevation and speed limitations; and § 213.331, Track surface.

(d) A qualifying TGMS shall be capable of producing, within 24 hours of the inspection, output reports that -

(1) Provide a continuous plot, on a constant-distance axis, of all measured track geometry parameters required in paragraph (c) of this section;

(2) Provide an exception report containing a systematic listing of all track geometry conditions which constitute an exception to the class of track over the segment surveyed.

(e) The output reports required under paragraph (c) of this section shall contain sufficient location identification information which enable field forces to easily locate indicated exceptions.

(f) Following a track inspection performed by a qualifying TGMS, the track owner shall, within two days after the inspection, field verify and institute remedial action for all exceptions to the class of track.

(g) The track owner shall maintain for a period of one year following an inspection performed by a qualifying TGMS, copy of the plot and the exception printout for the track segment involved, and additional records which:

(1) Specify the date the inspection was made and the track segment involved; and

(2) Specify the location, remedial action taken, and the date thereof, for all listed exceptions to the class.

(h) For track Classes 8 and 9, a qualifying Gage Restraint Measurement System (GRMS) shall be operated at least once annually with at least 180 days between inspections to continuously compare loaded track gage to unloaded gage under a known loading condition. The lateral capacity of the track structure shall not permit a gage widening ratio (GWR) greater than 0.5 inches.

(i) A GRMS shall meet or exceed minimum design requirements which specify that -

(1) Gage restraint shall be measured between the heads of the rail -

(i) At an interval not exceeding 16 inches;

(ii) Under an applied vertical load of no less than 10,000 pounds per rail;

(iii) Under an applied lateral load which provides for lateral/vertical load ratio of between 0.5 and 1.257, and a load severity greater than 3,000 pounds but less than 8,000 pounds per rail. Load severity is defined by the formula -

$$S = L - cV$$

where:

S = Load severity, defined as the lateral load applied to the fastener system (pounds).

L = Actual lateral load applied (pounds).

c = Coefficient of friction between rail/tie which is assigned a nominal value of (0.4).

V = Actual vertical load applied (pounds).

213.333(i)(2)

(2) The measured gage value shall be converted to a gage widening ratio (GWR) as follows:

Where:

UTG=Unloaded track gage measured by the GRMS vehicle at a point no less than 10 feet from any lateral or vertical load application.

LTG=Loaded track gage measured by the GRMS vehicle at the point of application of the lateral load.

L=Actual lateral load applied (pounds).

(j) At least one vehicle in one train per day operating in Classes 8 and 9 shall be equipped with functioning on-board truck frame and carbody accelerometers. Each track owner shall have in effect written procedures for the notification of track personnel when on-board accelerometers on trains in Classes 8 and 9 indicate a possible track-related condition.

(k) For track Classes 7 , 8 and 9, an instrumented car having dynamic response characteristics that are representative of other equipment assigned to service or a portable device that monitors on-board instrumentation on trains shall be operated over the track at the revenue speed profile at a frequency of at least twice within 60 days with not less than 15 days between inspections. The instrumented car or the portable device shall

monitor vertically and laterally oriented accelerometers placed near the end of the vehicle at the floor level. In addition, accelerometers shall be mounted on the truck frame. If the carbody lateral, carbody vertical, or truck frame lateral safety limits in the following table of vehicle/track interaction safety limits are exceeded, speeds will be reduced until these safety limits are not exceeded.

(l) For track Classes 8 and 9, an instrumented car having dynamic response characteristics that are representative of other equipment assigned to service shall be operated over the track at the revenue speed profile annually with not less than 180 days between inspections. The instrumented car shall be equipped with functioning instrumented wheelsets to measure wheel/rail forces. If the wheel/rail force limits in the following table of vehicle/track interaction safety limits are exceeded, speeds will be reduced until these safety limits are not exceeded.

(m) The track owner shall maintain a copy of the most recent exception printouts for the inspections required under paragraphs (k) and (l) of this section.  
[63 FR 33992, June 22, 1998; 63 FR 46102, August 28, 1998]

#### **§213.341 Initial inspection of new rail and welds.**

The track owner shall provide for the initial inspection of newly manufactured rail, and for initial inspection of new welds made in either new or used rail. A track owner may demonstrate compliance with this section by providing for:

(a) In-service inspection - A scheduled periodic inspection of rail and welds that have been placed in service, if conducted in accordance with the provisions of § 213.339, and if conducted not later than 90 days after installation, shall constitute compliance with paragraphs (b) and (c) of this section;

(b) Mill inspection - A continuous inspection at the rail manufacturer's mill shall constitute compliance with the requirement for initial inspection of new rail, provided that the inspection equipment meets the applicable requirements specified in § 213.339. The track owner shall obtain a copy of the manufacturer's report of inspection and retain it as a record until the rail receives its first scheduled inspection under § 213.339;

(c) Welding plant inspection - A continuous inspection at a welding plant, if conducted in accordance with the provisions of paragraph (b) of this section, and accompanied by a plant operator's report of inspection which is retained as a record by the track owner, shall constitute compliance with the requirements for initial inspection of new rail and plant welds, or of new plant welds made in used rail; and

(d) Inspection of field welds - An initial inspection of field welds, either those joining the ends of CWR strings or those made for isolated repairs, shall be conducted not less than one day and not more than 30 days after the welds have been made. The initial inspection may be conducted by means of portable test equipment. The track owner shall retain a

record of such inspections until the welds receive their first scheduled inspection under § 213.339.

(e) Each defective rail found during inspections conducted under paragraph (a) or (d) of this section shall be marked with highly visible markings on both sides of the web and base and the remedial action as appropriate under § 213.337 will apply.

#### **§213.343 Continuous welded rail (CWR).**

Each track owner with track constructed of CWR shall have in effect and comply with written procedures which address the installation, adjustment, maintenance and inspection of CWR, and a training program for the application of those procedures, which shall be submitted to the Federal Railroad Administration by March 21, 1999. FRA reviews each plan for compliance with the following -

(a) Procedures for the installation and adjustment of CWR which include -

(1) Designation of a desired rail installation temperature range for the geographic area in which the CWR is located; and

(2) De-stressing procedures/methods which address proper attainment of the desired rail installation temperature range when adjusting CWR.

(b) Rail anchoring or fastening requirements that will provide sufficient restraint to limit longitudinal rail and crosstie movement to the extent practical, and specifically addressing CWR rail anchoring or fastening patterns on bridges, bridge approaches, and at other locations where possible longitudinal rail and crosstie movement associated with normally expected train-induced forces, is restricted.

(c) Procedures which specifically address maintaining a desired rail installation temperature range when cutting CWR including rail repairs, in-track welding, and in conjunction with adjustments made in the area of tight track, a track buckle, or a pull-apart. Rail repair practices shall take into consideration existing rail temperature so that -

(1) When rail is removed, the length installed shall be determined by taking into consideration the existing rail temperature and the desired rail installation temperature range; and

(2) Under no circumstances should rail be added when the rail temperature is below that designated by paragraph (a)(1) of this section, without provisions for later adjustment.

(d) Procedures which address the monitoring of CWR in curved track for inward shifts of alignment toward the center of the curve as a result of disturbed track.

(e) Procedures which control train speed on CWR track when -

(1) Maintenance work, track rehabilitation, track construction, or any other event occurs which disturbs the roadbed or ballast section and reduces the lateral and/or longitudinal resistance of the track; and

(2) In formulating the procedures under this paragraph (e), the track owner shall -

(i) Determine the speed required, and the duration and subsequent removal of any speed restriction based on the restoration of the ballast, along with sufficient ballast re-consolidation to stabilize the track to a level that can accommodate expected train-induced forces. Ballast re-consolidation can be achieved through either the passage of train tonnage or mechanical stabilization procedures, or both; and

(ii) Take into consideration the type of crossties used.

(f) Procedures which prescribe when physical track inspections are to be performed to detect buckling prone conditions in CWR track. At a minimum, these procedures shall address inspecting track to identify -

(1) Locations where tight or kinky rail conditions are likely to occur;

(2) Locations where track work of the nature described in paragraph (e)(1) of this section have recently been performed; and

(3) In formulating the procedures under this paragraph (f), the track owner shall -

(i) Specify the timing of the inspection; and

(ii) Specify the appropriate remedial actions to be taken when buckling prone conditions are found.

(g) The track owner shall have in effect a comprehensive training program for the application of these written CWR procedures, with provisions for periodic re-training, for those individuals designated under § 213.305(c) of this part as qualified to supervise the installation, adjustment, and maintenance of CWR track and to perform inspections of CWR track.

(h) The track owner shall prescribe recordkeeping requirements necessary to provide an adequate history of track constructed with CWR. At a minimum, these records shall include:

(1) Rail temperature, location and date of CWR installations. This record shall be retained for at least one year; and

(2) A record of any CWR installation or maintenance work that does not conform with the written procedures. Such record shall include the location of the rail and be maintained until the CWR is brought into conformance with such procedures.



(i) As used in this section -

(1) Adjusting/de-stressing means the procedure by which a rail's temperature is re-adjusted to the desired value. It typically consists of cutting the rail and removing rail anchoring devices, which provides for the necessary expansion and contraction, and then re-assembling the track.

(2) Buckling incident means the formation of a lateral mis-alinement sufficient in magnitude to constitute a deviation of 5 inches measured with a 62-foot chord. These normally occur when rail temperatures are relatively high and are caused by high longitudinal compressive forces.

(3) Continuous welded rail (CWR) means rail that has been welded together into lengths exceeding 400 feet.

(4) Desired rail installation temperature range means the rail temperature range, within a specific geographical area, at which forces in CWR should not cause a buckling incident in extreme heat, or a pull-apart during extreme cold weather.

(5) Disturbed track means the disturbance of the roadbed or ballast section, as a result of track maintenance or any other event, which reduces the lateral or longitudinal resistance of the track, or both.

(6) Mechanical stabilization means a type of procedure used to restore track resistance to disturbed track following certain maintenance operations. This procedure may incorporate dynamic track stabilizers or ballast consolidators, which are units of work equipment that are used as a substitute for the stabilization action provided by the passage of tonnage trains.

(7) Rail anchors means those devices which are attached to the rail and bear against the side of the crosstie to control longitudinal rail movement. Certain types of rail fasteners also act as rail anchors and control longitudinal rail movement by exerting a downward clamping force on the upper surface of the rail base.

(8) Rail temperature means the temperature of the rail, measured with a rail thermometer.

(9) Tight/kinky rail means CWR which exhibits minute alinement irregularities which indicate that the rail is in a considerable amount of compression.

(10) Train-induced forces means the vertical, longitudinal, and lateral dynamic forces which are generated during train movement and which can contribute to the buckling potential.

(11) Track lateral resistance means the resistance provided to the rail/crosstie structure against lateral displacement.

(12) Track longitudinal resistance means the resistance provided by the rail anchors/rail fasteners and the ballast section to the rail/crosstie structure against longitudinal displacement.

(j) Track owners shall revise their CWR plans to include provisions for the inspection of joint bars in accordance with §§ 213.119(g) and (i)(3).

[63 FR 45959, August 28, 1998; 70 FR 66298, Nov. 2, 2005]

### **§213.345 Vehicle qualification testing.**

(a) All rolling stock types which operate at Class 6 speeds and above shall be qualified for operation for their intended track classes in order to demonstrate that the vehicle dynamic response to track alignment and geometry variations are within acceptable limits to assure safe operation. Rolling stock operating in Class 6 within one year prior to the promulgation of this subpart shall be considered as being successfully qualified for Class 6 track and vehicles presently operating at Class 7 speeds by reason of conditional waivers shall be considered as qualified for Class 7.

(b) The qualification testing shall ensure that, at any speed less than 10 m.p.h. above the proposed maximum operating speed, the equipment will not exceed the wheel/rail force safety limits and the truck lateral accelerations specified in § 213.333, and the testing shall demonstrate the following:

(1) The vertical acceleration, as measured by a vertical accelerometer mounted on the car floor, shall be limited to no greater than 0.55g single event, peak-to-peak.

(2) The lateral acceleration, as measured by a lateral accelerometer mounted on the car floor, shall be limited to no greater than 0.3g single event, peak-to-peak; and

(3) The combination of the lateral acceleration (L) and the vertical acceleration (V) within any period of two consecutive seconds as expressed by the square root of  $(V^2 + L^2)$  shall be limited to no greater than 0.604, where L may not exceed 0.3g and V may not exceed 0.55g.

(c) To obtain the test data necessary to support the analysis required in paragraphs (a) and (b) of this section, the track owner shall have a test plan which shall consider the operating practices and conditions, signal system, road crossings and trains on adjacent tracks during testing. The track owner shall establish a target maximum testing speed (at least 10 m.p.h. above the maximum proposed operating speed) and target test and operating conditions and conduct a test program sufficient to evaluate the operating limits of the track and equipment. The test program shall demonstrate vehicle dynamic response as speeds are incrementally increased from acceptable Class 6 limits to the target maximum test speeds. The test shall be suspended at that speed where any of the safety limits specified in paragraph (b) are exceeded.

(d) At the end of the test, when maximum safe operating speed is known along with permissible levels of cant deficiency, an additional run shall be made with the subject equipment over the entire route proposed for revenue service at the speeds the railroad will request FRA to approve for such service and a second run again at 10 m.p.h. above this speed. A report of the test procedures and results shall be submitted to FRA upon the completions of the tests. The test report shall include the design flange angle of the equipment which shall be used for the determination of the lateral to vertical wheel load safety limit for the track/vehicle interaction safety measurements required per § 213.333(l).

(e) As part of the submittal required in paragraph (d) of the section, the operator shall include an analysis and description of the signal system and operating practices to govern operations in Classes 7 and 8. This statement shall include a statement of sufficiency in these areas for the class of operation. Operation at speeds in excess of 150 m.p.h. is authorized only in conjunction with a rule of particular applicability addressing other safety issues presented by the system.

(f) Based on test results and submissions, FRA will approve a maximum train speed and value of cant deficiency for revenue service.

[63 FR 54078, October 08, 1998]

#### **§213.347 Automotive or railroad crossings at grade.**

(a) There shall be no at-grade (level) highway crossings, public or private, or rail-to-rail crossings at-grade on Class 8 and 9 track.

(b) If train operation is projected at Class 7 speed for a track segment that will include rail-highway grade crossings, the track owner shall submit for FRA's approval a complete description of the proposed warning/barrier system to address the protection of highway traffic and high speed trains. Trains shall not operate at Class 7 speeds over any track segment having highway-rail grade crossings unless:

(1) An FRA-approved warning/barrier system exists on that track segment; and

(2) All elements of that warning/barrier system are functioning.

#### **§213.353 Turnouts, crossovers and lift rail assemblies or other transition devices on moveable bridges.**

(a) In turnouts and track crossings, the fastenings must be intact and maintained so as to keep the components securely in place. Also, each switch, frog, and guard rail shall be kept free of obstructions that may interfere with the passage of wheels. Use of rigid rail crossings at grade is limited per § 213.347.

(b) Track shall be equipped with rail anchoring through and on each side of track crossings and turnouts, to restrain rail movement affecting the position of switch points

and frogs. Elastic fasteners designed to restrict longitudinal rail movement are considered rail anchoring.

(c) Each flangeway at turnouts and track crossings shall be at least 1 ½ inches wide.

(d) For all turnouts and crossovers, and lift rail assemblies or other transition devices on moveable bridges, the track owner shall prepare an inspection and maintenance Guidebook for use by railroad employees which shall be submitted to the Federal Railroad Administration. The Guidebook shall contain at a minimum -

(1) Inspection frequency and methodology including limiting measurement values for all components subject to wear or requiring adjustment.

(2) Maintenance techniques.

(e) Each hand operated switch shall be equipped with a redundant operating mechanism for maintaining the security of switch point position.

#### **§213.361 Right of way.**

The track owner in Class 8 and 9 shall submit a barrier plan, termed a "right-of-way plan," to the Federal Railroad Administration for approval. At a minimum, the plan will contain provisions in areas of demonstrated need for the prevention of -

(a) Vandalism;

(b) Launching of objects from overhead bridges or structures into the path of trains; and

(c) Intrusion of vehicles from adjacent rights of way.

#### **§213.369 Inspection records.**

(a) Each owner of track to which this part applies shall keep a record of each inspection required to be performed on that track under this subpart.

(b) Except as provided in paragraph (e) of this section, each record of an inspection under § 213.365 shall be prepared on the day the inspection is made and signed by the person making the inspection. Records shall specify the track inspected, date of inspection, location and nature of any deviation from the requirements of this part, and the remedial action taken by the person making the inspection. The owner shall designate the location(s) where each original record shall be maintained for at least one year after the inspection covered by the record. The owner shall also designate one location, within 100 miles of each state in which they conduct operations, where copies of record which apply to those operations are either maintained or can be viewed following 10 days notice by the Federal Railroad Administration.

(c) Rail inspection records shall specify the date of inspection, the location and nature of any internal defects found, the remedial action taken and the date thereof, and the location of any intervals of track not tested per § 213.339(d). The owner shall retain a rail inspection record for at least two years after the inspection and for one year after remedial action is taken.

(d) Each owner required to keep inspection records under this section shall make those records available for inspection and copying by the Federal Railroad Administrator.

(e) For purposes of compliance with the requirements of this section, an owner of track may maintain and transfer records through electronic transmission, storage, and retrieval provided that -

(1) The electronic system be designed such that the integrity of each record maintained through appropriate levels of security such as recognition of an electronic signature, or other means, which uniquely identify the initiating person as the author of that record. No two persons shall have the same electronic identity;

(2) The electronic storage of each record shall be initiated by the person making the inspection within 24 hours following the completion of that inspection;

(3) The electronic system shall ensure that each record cannot be modified in any way, or replaced, once the record is transmitted and stored;

(4) Any amendment to a record shall be electronically stored apart from the record which it amends. Each amendment to a record shall be uniquely identified as to the person making the amendment;

(5) The electronic system shall provide for the maintenance of inspection records as originally submitted without corruption or loss of data; and

(6) Paper copies of electronic records and amendments to those records, that may be necessary to document compliance with this part, shall be made available for inspection and copying by the FRA and track inspectors responsible under § 213.305. Such paper copies shall be made available to the track inspectors and at the locations specified in paragraph (b) of this section.

(7) Track inspection records shall be kept available to persons who performed the inspection and to persons performing subsequent inspections.

(f) Each vehicle/track interaction safety record required under § 213.333(g), and (m) shall be made available for inspection and copying by the FRA at the locations specified in paragraph (b) of this section.

[63 FR 33992, June 22, 1998]

