

compound or even transverse fissures with which they should not be confused or classified.

(10) *Ordinary break* means a partial or complete break in which there is no sign of a fissure, and in which none of the other defects described in this paragraph (b) are found.

(11) *Damaged rail* means any rail broken or injured by wrecks, broken, flat, or unbalanced wheels, slipping, or similar causes.

(12) *Flattened rail* means a short length of rail, not at a joint, which has flattened out across the width of the rail head to a depth of 3/8 inch or more below the rest of the rail. Flattened rail occurrences have no repetitive regularity and thus do not include corrugations, and have no apparent localized cause such as a weld or engine burn. Their individual length is relatively short, as compared to a condition such as head flow on the low rail of curves.

(13) *Bolt hole crack* means a crack across the web, originating from a bolt hole, and progressing on a path either inclined upward toward the rail head or inclined downward toward the base. Fully developed bolt hole cracks may continue horizontally along the head/web or base/web fillet, or they may progress into and through the head or

base to separate a piece of the rail end from the rail. Multiple cracks occurring in one rail end are considered to be a single defect. However, bolt hole cracks occurring in adjacent rail ends within the same joint must be reported as separate defects.

(14) *Defective weld* means a field or plant weld containing any discontinuities or pockets, exceeding 5 percent of the rail head area individually or 10 percent in the aggregate, oriented in or near the transverse plane, due to incomplete penetration of the weld metal between the rail ends, lack of fusion between weld and rail end metal, entrapment of slag or sand, under-bead or other shrinkage cracking, or fatigue cracking. Weld defects may originate in the rail head, web, or base, and in some cases, cracks may progress from the defect into either or both adjoining rail ends.

(15) *Head and web separation* means a progressive fracture, longitudinally separating the head from the web of the rail at the head fillet area.

[63 FR 34029, June 22, 1998; 63 FR 51639, Sept. 28, 1998]

§213.115 Rail end mismatch.

Any mismatch of rails at joints may not be more than that prescribed by the following table—

Class of track	Any mismatch of rails at joints may not be more than the following—	
	On the tread of the rail ends (inch)	On the gage side of the rail ends (inch)
Class 1 track	1/4	1/4
Class 2 track	1/4	3/16
Class 3 track	3/16	3/16
Class 4 and 5 track	1/8	1/8

§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 physical track inspections to detect cracks and other indications of incipient failures in joints in CWR. This paragraph is effective January 3, 2006.

(1) At a minimum, these procedures shall address periodic and special on-foot inspection of joints and of the track adjacent to joints, in order to identify—

(i) Joint bars with visible or otherwise detectable cracks;

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

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

(iv) 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.

(2) In formulating the procedures under paragraph (g)(1) of this section, the track owner shall—

(i) Implement a system for identifying each joint by its location in track with sufficient precision that personnel can return to the joint and identify it without ambiguity;

(ii) List each joint in an inventory that will enable personnel to identify joints due for periodic inspection;

(iii) Specify the conditions of potential joint failure for which personnel must inspect, including, at a minimum, the items listed in paragraph (g)(1) of this section;

(iv) Specify the appropriate remedial actions, consistent with this part, that should be taken when personnel find conditions of potential joint failure; and

(v) Specify the timing of the inspections, which should be based on the configuration and condition of the joint. At a minimum, track owners must specify that all joints in CWR in track classes 4 and higher must be inspected before October 31, 2006 and within 190 days of the previous inspection hereafter; and all joints in CWR in track classes 3, and class 2 track on which passenger trains operate, must be inspected before April 30, 2007 and within 370 days of the previous inspection thereafter.

(3) In lieu of the requirements for the inspection of rail joints contained in paragraphs (g)(1) and (2) of this section, a track owner may seek approval from FRA to use alternate procedures.

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

(ii) If the Associate Administrator finds that the alternate procedures provide an equivalent or higher level of safety than the requirements in paragraphs (g)(1) and (g)(2) 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) and (2) of this section.

(iii) While a determination is pending with the Associate Administrator on a request submitted pursuant to para-

graph (g)(3) of this section, the track owner shall continue to comply with the requirements contained in paragraphs (g)(1) and (2) 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 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.

(i) After the initial inspection of each joint in accordance with paragraph (g) of this section, the track owner must include in the record:

(A) The location of each joint in CWR with such precision that the joint can be located and identified in the field with no ambiguity;

(B) The results of the inspection of each joint; and

(C) Any remedial action required under the track owner's CWR plan.

(ii) Track owners shall maintain records required by paragraph (i)(3)(i) in accordance with §213.241.

(j) 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-alignment sufficient in magnitude to constitute a deviation from the Class 1 requirements

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specified in §213.55. 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 by the rail/crosstie structure against lateral displacement.

(12) *Track Longitudinal Resistance* means the resistance provided by the rail anchors/rail fasteners and the bal-

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last section to the rail/crosstie structure against longitudinal displacement.

[63 FR 34029, June 22, 1998; 63 FR 46102, Aug. 28, 1998; 63 FR 49382, Sept. 15, 1998; 70 FR 66297, Nov. 2, 2005]

§213.121 Rail joints.

(a) Each rail joint, insulated joint, and compromise joint shall be of a structurally sound design and dimensions for the rail on which it is applied.

(b) If a joint bar on Classes 3 through 5 track is cracked, broken, or because of wear allows excessive vertical movement of either rail when all bolts are tight, it shall be replaced.

(c) If a joint bar is cracked or broken between the middle two bolt holes it shall be replaced.

(d) In the case of conventional jointed track, each rail shall be bolted with at least two bolts at each joint in Classes 2 through 5 track, and with at least one bolt in Class 1 track.

(e) In the case of continuous welded rail track, each rail shall be bolted with at least two bolts at each joint.

(f) Each joint bar shall be held in position by track bolts tightened to allow the joint bar to firmly support the abutting rail ends and to allow longitudinal movement of the rail in the joint to accommodate expansion and contraction due to temperature variations. When no-slip, joint-to-rail contact exists by design, the requirements of this paragraph do not apply. Those locations when over 400 feet in length, are considered to be continuous welded rail track and shall meet all the requirements for continuous welded rail track prescribed in this part.

(g) No rail shall have a bolt hole which is torch cut or burned in Classes 2 through 5 track. For Class 2 track, this paragraph (g) is applicable September 21, 1999.

(h) No joint bar shall be reconfigured by torch cutting in Classes 3 through 5 track.

§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