DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

49 CFR Part 213

[Docket No. RST–90–1, Notice No. 8]

RIN 2130–AA75

Track Safety Standards

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

ACTION: Final rule.

SUMMARY: FRA amends the Track Safety Standards to update and enhance its track safety regulatory program. To address today's railroad operating environment, these amendments present additional regulatory requirements, including standards specifically addressing high speed train operations. FRA issues these changes to improve track safety and provide the railroad industry with the flexibility needed to effect a safer and more efficient use of resources. The amendments reflect recommendations submitted to FRA by the Railroad Safety Advisory Committee. The provisions included in this notice become effective with this rule. However, FRA anticipates that further amendments will be added to address the use of Gage Restraint Measuring Systems.

DATES: *Effective Date:* This final rule is effective September 21, 1998.

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SUPPLEMENTARY INFORMATION:

Introduction

The first Federal Track Safety Standards were implemented in October, 1971, following the enactment of the Federal Railroad Safety Act of 1970 in which Congress granted to FRA comprehensive authority over ''all areas of railroad safety.'' See 36 FR 20336 and 49 U.S.C. 20101 *et seq.* FRA envisioned the new standards to be an evolving set of safety requirements subject to continuous revision allowing the regulations to keep pace with industry innovations and agency research and development.

FRA amended the Track Safety Standards with minor revisions several times in the past two decades. It began a project to revise the standards extensively in 1978, but later withdrew the effort when investigation revealed that considerably more data collection and analysis were necessary to support recommended revisions. A less extensive revision of the Track Safety Standards was issued in November, 1982. Since then, FRA has acquired much information crucial to further development of the Track Safety Standards through the enhanced statistical analysis capabilities resulting from additional field reporting requirements and improved data collection processes.

Statutory Background

The Rail Safety Enforcement and Review Act of 1992, Public Law 102–365, 106 Stat. 972 (September 3, 1992), later amended by the Federal Railroad Safety Authorization Act of 1994, Public Law 103–440, 108 Stat. 4615 (November 2, 1994), requires FRA to revise the track safety regulations contained in 49 CFR Part 213. Now codified at 49 U.S.C. § 20142, the amended statute requires:

> (a) Review of Existing Regulations.—Not later than March 3, 1993, the Secretary of Transportation shall begin a review of Department of Transportation regulations related to track safety standards. The review at least shall include an evaluation of—
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> (1) Procedures associated with maintaining and installing continuous welded rail and its attendant structure, including cold weather installation procedures;
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> (2) The need for revisions to regulations on track excepted from track safety standards; and
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> (3) Employee safety.
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> (b) Revision of Regulations.—Not later than September 1, 1995, the Secretary shall prescribe regulations and issue orders to revise track safety standards, considering safety information presented during the review under subsection (a) of this section and the report of the Comptroller General submitted under subsection (c) of this section.
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> (d) Identification of Internal Rail Defects.—In carrying out subsections (a) and (b), the Secretary shall consider whether or not to prescribe regulations and issue orders concerning—
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> (1) Inspection procedures to identify internal rail defects, before they reach imminent failure size, in rail that has significant shelling; and
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> (2) Any specific actions that should be taken when a rail surface condition, such as shelling, prevents the identification of internal defects.

Petitions for Rulemaking

In May, 1990, the Brotherhood of Maintenance of Way Employes (BMWE) filed a petition with FRA to revise the Track Safety Standards. The petition suggested substantive changes to the standards, the addition of new regulations addressing recent developments in the industry, as well as the reinstatement of many of the regulations deleted from the standards in 1982. The BMWE also petitioned FRA to further address employee safety by incorporating in the Track Safety Standards certain sections of the Occupational Safety and Health Standards presently administered by the U.S. Department of Labor.

In March, 1992, the Association of American Railroads (AAR) submitted to FRA a list of recommended revisions to the Track Safety Standards. The AAR suggested some changes in the wording of existing regulations to provide additional flexibility to accommodate future innovations in railroad technology. Several suggested revisions included new approaches to determining compliance with certain existing regulations. Most notable among those was AAR's proposal that the revised track standards permit the use of a Gage Restraint Measuring System (GRMS) in place of detailed crosstie and fastener requirements.

Proceedings to Date

On November 16, 1992, FRA published an Advance Notice of Proposed Rulemaking (ANPRM) in this docket. *See* 57 FR 54038. The ANPRM summarized FRA's knowledge about developments in the rail industry in the past two decades and then posed some 52 questions regarding how those developments should be addressed in the revised track safety standards.

The ANPRM also announced plans for four public workshops in which technically-knowledgeable persons with specialized experience in track maintenance were invited to share their views with FRA in an informal setting. The workshops were fact-finding sessions comprised of informal give-and-take exchanges between industry, labor, and government professionals charged with the administration of the track safety standards on a day-to-day basis. They constituted an initial step by FRA to use more active collaboration with labor, railroad management, manufacturers, state governments, and public interest associations in structuring the revised regulations.

Participants in the workshops included representatives of major and short line railroads, the AAR, the American Short Line Railroad Association (ASLRA), the BMWE, as well as individuals with a particular interest in certain areas of the track safety standards. In addition to the workshops, FRA invited interested

persons to submit written comments to the questions posed in the ANPRM. Approximately 30 individuals, railroads, and industry groups submitted their suggestions and observations.

Following one workshop which included an extensive discussion about the safety of maintenance-of-way employees, FRA decided to isolate that issue from this proceeding so that it could be addressed thoroughly in a separate rulemaking. That issue became the focus of a proceeding addressing roadway worker safety, FRA's first negotiated rulemaking. FRA established its first formal regulatory negotiation committee in 1994. After months of discussions and debates, the committee reached consensus conclusions and recommended provisions for an NPRM to the Federal Railroad Administrator (Administrator) on May 17, 1995. An NPRM based upon those recommendations was published on March 14, 1996 (*see* 61 FR 10528), and a final rule was issued on December 16, 1996 (*see* 61 FR 65959). Thus, a significant portion of the mandate of the Rail Safety Enforcement and Review Act of 1992 calling for a general revision of the Track Safety Standards already has become effective.

The Railroad Safety Advisory Committee and the Track Working Group

In past rulemakings, interested parties generally have approached the proceedings in an adversarial manner, a tactic that often inhibited the development of the best regulatory solutions to resolve difficult safety issues. In addition, parties also have resorted to pressuring Congress for legislation that would grant regulatory results with which FRA disagreed or were at odds with FRA's regulatory agenda. FRA concluded, therefore, that inclusion of these parties in its regulatory process would result in a more positive approach to developing the best solutions to pressing safety problems.

Although FRA gathered much information in the 1993 track workshops, as well as in similar workshops associated with other rulemaking proceedings, the agency recognized that continued use of these ''ad hoc'' collaborative procedures for each rulemaking was not the most effective means of accomplishing the agency's goal of achieving a more consensus-based regulatory program. Following the success in 1995 of the negotiated rulemaking addressing roadway worker safety, FRA decided that several pending rulemakings, including this proceeding to revise Part 213, should advance under a new rulemaking model that relies upon consensus among various members of the affected industry and the regulated community. On March 11, 1996, FRA announced formation of the Railroad Safety Advisory Committee (RSAC), the centerpiece of the agency's new regulatory program which emphasizes rulemaking by consensus with those most affected by the agency's regulations. *See* 61 FR 740.

The RSAC is comprised of 48 individual representatives drawn from 27 member organizations. The membership of the RSAC is representative of those interested in railroad safety issues, including railroad owners, manufacturers, labor groups, state government groups, and public interest associations. It's sponsor is the Administrator, who recommends specific issues for it to address. The RSAC operates by consensus. It is authorized to establish smaller ''working groups'' to research and initially address the issues recommended by the Administrator and accepted by the RSAC to resolve.

Most of the text of this final rule was recommended to FRA by the RSAC. The committee was tasked by the Administrator to formulate and present to FRA recommendations for new regulations and revisions of existing ones.

In accordance with established RSAC procedures, RSAC formed a Track Working Group, comprised of approximately 30 representatives from railroads, rail labor, trade associations, state government, track equipment manufacturers, and FRA, to develop and draft a proposed rule for the revision of Part 213. It met periodically over a span of six months in 1996.

The Track Working Group identified issues for discussion from several sources. One source of issues was, of course, the statutory mandates issued by Congress in 1992 and in 1994. Two other sources were the BMWE's petition and AAR proposals. Several issues came to the Track Working Group by way of requests for consideration made by FRA's track safety Technical Resolution Committee. The group also examined track issues involved in a number of recommendations made to FRA by the National Transportation Safety Board (NTSB) in the past decade. Discussions utilized information acquired by FRA through its research and development program, as well as from findings from routine agency investigations and accident investigations. Finally, the Track Working Group systematically surveyed the existing regulations to identify those sections and subsections that needed updating or, in some cases, deletion.

At a public meeting on October 31, 1996, the Track Working Group presented its proposed rule to the RSAC for approval to recommend it to the Administrator. As required by RSAC procedures, each provision in the proposed rule had received unanimous approval by the members of the Track Working Group. At the request of the BMWE, the RSAC agreed to defer the vote on whether to recommend the proposed rule to the Administrator to provide that organization additional time to inform its members. At the time of the formal vote by mail on November 21, 1996, representatives of many of the labor unions withdrew support of the proposed rule and recommended that it be returned to the Track Working Group for further discussion.

Despite the lack of support by many RSAC representatives of rail labor, the number of votes cast in favor of recommending the proposed rule to the Administrator exceeded the number necessary for a simple majority. RSAC's procedures provide that where there is a majority vote to recommend to the Administrator a rule presented to the RSAC with full consensus of the working group that produced it, the RSAC will recommend adoption of the rule by the Administrator. Following those procedures, the RSAC formally recommended to the Administrator that FRA issue the proposed rule as it was drafted.

On July 3, 1997, FRA published a Notice of Proposed Rulemaking (NPRM) which included substantially the same rule text and preamble developed by the Track Working Group. *See* 62 FR 36138. In developing the regulatory evaluation for the NPRM, FRA attempted to incorporate additional data in the cost/benefit analysis beyond the impact data provided by the Track Working Group. In the NPRM, FRA requested additional relevant data to use in the regulatory evaluation for this final rule, but parties who had access to relevant data did not respond to that request.

Comments and Responses

The NPRM generated comments from 12 sources. Four of the commenters, namely, the AAR, the BMWE, the ASLRA, and Amtrak, were represented on the Track Working Group and helped draft the recommended rule which became the basis for the NPRM. All four of those commenters expressed support for the RSAC process.

The BMWE stated that it agrees with many of the revisions proposed in the NPRM, but that the standards proposed

therein ''do not go far enough to ensure the integrity of the track structure.'' The BMWE stated that ''several significant deficiencies'' led that group, as well as RSAC members representing other labor organizations, to recommend to RSAC that the proposed rule as drafted by the Track Working Group be returned to that group for further consideration.

The AAR, in its comments to the docket, stated that it continues to support the NPRM and the language drafted by the Track Working Group. However, the AAR also added a request that should FRA revise any of the proposed rule in direct response to comments by RSAC participants who withdrew support of the rule drafted by the Track Working Group, then FRA would also re-examine the positions the AAR originally expressed about those issues. The AAR stated that its support of the proposed rule reflects that organization's willingness to compromise some of its positions in the interest in reaching consensus about the proposed rule in the Track Working Group. Therefore, the AAR's general support of the NPRM should not be misconstrued as agreement by the organization with each and every provision of the NPRM.

FRA has not significantly changed the NPRM based on comments from other RSAC participants who withdrew support for the rule proposed by the Track Working Group. Thus the AAR's suggested revisions based on that contingency are not examined in the ''Section By Section Analysis'' portion of this final rule.

Continuous Welded Rail (CWR)

In the first track safety standards published in 1971, § 213.119 dealt with CWR in a rather general manner, stating simply that CWR must be installed at a rail temperature that prevents lateral displacement of track or pull-aparts of rail ends, and that it should not be disturbed at rail temperatures higher than the installation or adjusted installation temperature. (*See* 36 FR 20341.) In 1979, when FRA proposed a significant revision of Part 213, the agency suggested that this subsection be eliminated because it provided ''little guidance to railroads'' and was ''difficult to enforce.'' The agency further stated that research had ''not advanced to the point where specific safety requirements can be established.'' (*See* 44 FR 52114.) However, when the proposed revision was withdrawn in 1981 (*see* 46 FR 32896), the proposal to eliminate § 213.119 was also abandoned. In the November, 1982 revisions to the Track Safety Standards, § 213.119 was deleted.

In the Rail Safety Enforcement and Review Act of 1992, Congress mandated FRA to evaluate procedures for installing and maintaining CWR. In 1994, in the Federal Railroad Authorization Act, Congress added an evaluation of cold weather installation procedures to that mandate. In light of the evaluation of those procedures, as well as information resulting from FRA's own research and development, this final rule returns CWR procedures to Part 213.

CWR is naturally subjected to high compressive and tensile forces which, if not adequately restrained, can result in track buckling or pull-aparts. The potential for track buckling increases as the ambient air temperature increases while the potential for pull-aparts increases as the ambient air temperature decreases. Track buckling tends to occur under train movement and therefore can be instantaneous and somewhat unpredictable.

In recent years, FRA engaged in a research program to develop criteria and guidelines for improving CWR's resistance to buckling. The program sought to (1) define critical forces and conditions associated with track buckling, (2) quantify parameters which govern the resistance of track to buckling, and (3) develop technology to detect incipient failures prior to track buckling. Railroads have also invested considerable resources into CWR research and employee training which has resulted in a marked decrease in the number of reportable buckled track incidents over the last decade. FRA's Accident/Incident data base reveals that the number of reportable buckled track derailments has been reduced by approximately 50% since 1985, dropping from a yearly average of approximately 60 instances to approximately 30 such occurrences per year.

How a railroad provides the adequate lateral resistance to prevent track buckling may vary from railroad to railroad. The Track Working Group found that consistent methodology is not as important as effective methodology in installing and maintaining CWR. Therefore, the Track Working Group's recommendations and the new subsection (§ 213.119) are premised on the concept that the regulations should provide railroads with as much flexibility as safely feasible. The new subsection allows railroads to develop and implement their individual CWR programs based on procedures which have proven effective for them over the years. At a minimum, procedures shall be developed for the installation, adjustment, maintenance, and inspection of CWR, as well as a training program and minimal requirements for recordkeeping. FRA fully expects the railroad industry to take advantage of continuing research initiatives to update and enhance their CWR procedures, and cautions railroads not to develop less than acceptable CWR procedures as a means to lessen the effect of regulatory oversight. FRA will monitor the railroads' adherence to these procedures as well as the overall effectiveness of the CWR programs.

While the CWR provision, as proposed, received support from some commenters (the NTSB), others were critical of the new provision. The AAR called it ''a classic case of overregulation'' and suggested that the provision require track owners only to have CWR procedures and training programs in effect and accessible to FRA. While it supported the provision as a means to enhance track safety, the BMWE also advised that the provision lacks a means to address railroads' non-compliance with their own CWR programs. The ASLRA suggested that railroads should have the option of excluding from their CWR plans any trackage over which trains do not operate at speeds over 30 m.p.h. and which do not exceed one million gross ton miles in traffic annually. The AAR also stated that it generally supports the provision as drafted by the Track Working Group and that its suggestions for changes were to be considered only in the event FRA decides to revise the proposed provision in response to recommendations of other RSAC participants who, after helping to draft the recommended NPRM, withdrew support for the recommendation. All three commenters who expressed negative comments were active participants in the Track Working Group and helped to draft the language which adds the provision for CWR in this final rule.

Excepted Track

With some limitations, the excepted track regulation permits railroads to designate track as ''excepted'' from compliance with minimum safety requirements for roadbed, track geometry and track structure. FRA added the excepted track provision (§ 213.4) to the regulations in 1982 in response to an industry outcry for regulatory relief on those rail lines producing little or no income. FRA believed that without some relief for low density lines, railroads would accelerate abandonment of those lines rather than invest their slim resources where returns would be limited.

Therefore, the 1982 revision provided the industry with a means to operate over designated tracks without complying with the substantive requirements of the Track Safety Standards. FRA believed that the designated tracks would be located in yards or otherwise on comparatively level terrain in areas where the likelihood was remote that a derailment would endanger a train crew or the general public.

The 1982 provision contains a number of operating restrictions, including limitations on where excepted track can be located and the number of cars containing hazardous materials (five) that can be hauled in one train. Maximum speed is 10 m.p.h., and passenger service is prohibited.

Despite these limitations, railroads have embraced the concept of excepted track. In 1992, an FRA survey revealed the existence of approximately 12,000 miles of designated excepted track nationwide, far more than FRA envisioned when the provision was added to the regulations. Recent surveys conducted by the AAR and the ASLRA indicate that between 8,000 and 9,000 miles of excepted track presently exist nationwide.

Comments to the ANPRM, the NPRM, as well as some opinions expressed within the Track Working Group, showed that many railroads favor maintaining an excepted track provision in the Track Safety Standards. They argued that accident and injury data do not support the notion that trackage in ''excepted'' status presents any significant safety hazard. FRA's data show that between 1990 and 1995, track-caused derailments on excepted track caused three reportable injuries and one release of hazardous materials. In commenting on the NPRM, the ASLRA stated that, in a recent survey of short line railroads, 146 railroads that reported having excepted track had 122 reportable accidents in a five-year period from 1991 through 1995. Of those accidents, 87 were track-related.

The ASLRA strenuously argued that short line railroads depend on the excepted track provision in order to keep certain track segments in business. Many short lines operate over track they acquired just before abandonment by a major railroad. A significant number of those lines serve only a handful of industries with comparatively small gross tonnage. The ASLRA commented that the cost to short line railroads to upgrade and maintain excepted track would exceed $230 million. Elimination of the excepted track provision would cause the abandonment of approximately 95 lines affecting 1,063 shippers who may be then compelled to use highway transportation.

Approximately 65% of all reportable derailments on excepted track from 1988 through the third quarter of 1995 were track-caused. Of those, nearly 33% were attributed to wide gage as a result of defective crossties or rail fasteners. Several commenters expressed approval of some type of gage restriction. The BMWE suggested that the revised provision should also address the condition and placement of ties and fasteners, as well as switch maintenance and rail/joint bar defects.

The AAR commented that the gage restrictions proposed in the NPRM should be eliminated. The AAR stated that there are situations where wide gage is safe, for instance, in road crossings. In those cases, pavement would have to be destroyed and replaced to correct wide gage when the pavement would have restricted wheel position and prevented a derailment. The AAR also stated that it recommends that the gage restriction be eliminated only if FRA decides to revise the proposed provision based on the comments of other RSAC participants who helped draft the recommendations and then later withdrew support of them. Otherwise, the AAR supports the NPRM as drafted by the Track Working Group.

Because none of the commenters presented FRA with a compelling reason to make further changes to the gage restrictions in the excepted track provision, this final rule adopts the language as recommended by the Track Working Group and as proposed in the NPRM. Under this final rule, track owners must maintain gage to a 58¼″ standard and perform periodic switch inspections.

FRA and state inspectors have found instances where railroads have taken advantage of the permissive language in the 1982 provision to conduct operations in a manner not envisioned when FRA drafted the provision. For example, a railroad removes a segment of track from the excepted designation only long enough to move a train with more than five cars carrying hazardous materials, or to operate an excursion passenger train, and then replaces the segment in excepted status as soon as the movement is completed. The BMWE and the NTSB suggested that the revised provision include time limits for the use of this provision over any segment of track. The final rule adopts the language as proposed in the NPRM and requires railroads to provide FRA with notification 10 days prior to removing track from excepted status.

The revision also changes the word ''revenue'' to ''occupied'' in describing passenger trains prohibited from operating over excepted track. This change codifies FRA's long-standing interpretation of the 1982 provision which allowed trains on excepted track to be occupied by crews, work gangs, and other railroad employees attending to their job-related duties. It is also designed to dispel the misconception by some railroads that passengers could be hauled over excepted track as long as they were not charged, and the railroad received no ''revenue,'' for their transportation. The purpose of the passenger prohibition is to safeguard railroad passengers; its purpose is not concerned with the revenue-generating power of passenger service.

Liability Standard

The current track regulations are enforced against a track owner ''who knows or has notice'' that the track does not meet compliance standards. This knowledge standard is unique to the track regulations; other FRA regulations are based on strict liability. The knowledge standard is founded on the notion that railroads cannot prevent the occurrence of some defects in track structures that are continually changing in response to the loads imposed on them by traffic and effects of weather. Many defects may not be detected even when the track owner exercises reasonable care. Therefore, track owners should be held responsible only for those defects about which they know or should know. Today, even after years of track abandonments by major railroads, the industry is responsible for maintaining about 200,000 miles of track. Many defects occur suddenly in remote areas, making it difficult for even the most diligent track inspectors to keep pace with all defects as they happen.

With a knowledge standard attached to the track regulations, railroads are held liable for non-compliance or civil penalties for only those defects that they knew about or those that are so evident the railroad is deemed to have known about them. FRA and state inspectors meet this knowledge standard in a number of ways. Sometimes they record and notify a railroad of a defect that they find, and then re-inspect later to see if the defect has been repaired. If it has not, they may cite the railroad for a violation of the track safety standards. While this method provides a failsafe way of proving railroad notice of a defect, it is not always practicable for inspectors to perform follow-up inspections. Such a system would make railroads responsible only for defects

FRA already has detected, which is clearly not a sufficient incentive to comply.

Often, inspectors choose to inspect the railroad's own inspection records to see if a defect they have noted is recorded there. If it is, the inspection record forms proof that the railroad had notice of the defect. If the defect is not recorded in the railroad's inspection records, but is of the nature that it would have had to exist at the time of the railroad's last inspection (for example, defective crossties or certain breaks that are covered with rust) and would have been detected with the exercise of reasonable care, the defect's existence constitutes constructive knowledge by the railroad and the railroad is cited for a violation. FRA's reading of its ''knows or has notice'' standard has been its long-standing enforcement policy and is explained in FRA's Track Enforcement Manual.

In its petition, the BMWE suggested that FRA put track owners under a strict liability standard by removing the phrase ''knows or has notice'' from § 213.5. Under that standard, any defect found by an FRA inspector could be written as a violation regardless of the railroad's ignorance of it or the railroad's opportunity to have detected it under the required inspection schedule. The AAR requested in its petition that FRA develop performance standards for the track regulations. Certain defects would not be cited as long as the track is performing safely, making unnecessary many of the regulations (for example, inspection requirements and the minimum number of crossties). The inherent weakness in such a proposal is that railroads will develop differing internal requirements for track inspection and maintenance. Some railroads may not be as vigilant as others in spotting defects or potential defects. Track defects compromising safety may not be discovered until the track fails, causing a derailment and possibly injuries and death.

Neither the BMWE nor the AAR provided FRA with cost/benefit information to support their respective requests.

The Track Working Group considered and rejected both proposals, finding that the existing language, as it has been enforced to date, strikes the best balance of all interests. Therefore, the NPRM proposed to leave the standard of liability unchanged. In its comments on the NPRM, the BMWE again proposed that the standard of liability be changed to that of strict liability. According to the BMWE, the current language encourages railroads to under-report track defects and offers the railroads no disincentive from assigning railroad track inspectors ''overly-expansive inspection territories'' resulting in less thorough and comprehensive track inspections.

In preparing this final rule, FRA weighed the BMWE comments, as well as its own enforcement experience, against the consensus-based recommendation of the Track Working Group which representatives of the railroads, FRA, and labor developed. FRA has concluded that the Track Working Group struck the right balance, and thus in this final rule, railroads will continue to be held liable for track defects of which they knew or had notice. Even if a railroad has not recorded those defects, notice may include constructive knowledge of defects that, by their nature, would have had to be in existence when the railroad was last required to perform an inspection.

Moreover, the penalty provision now makes clear what has been the law for many years, *i.e.*, that anyone who makes a false report under the safety laws is liable for criminal penalties under 49 U.S.C. 21311. This should provide an additional deterrent to anyone who would purposely under-report defects.

Tourist Railroads

The Track Safety Standards apply to only those tourist railroads that operate on the general system. FRA estimates that approximately 95 tourist railroads operating over 1,350 miles of standard gage track off the general system are not currently subject to the track safety standards. The agency sees the need to address this growing market and increasing safety exposure in the area of track safety, as well as other areas of rail operation.

In April, 1996, FRA referred tourist railroad safety issues to the RSAC. The RSAC, in turn, established a working group comprised of agency and tourist railroad industry representatives to analyze the industry's unique aspects and formulate recommendations for appropriate regulation of that specialized industry. Among the issues the working group will examine is track safety. The findings of that group may or may not lead to a recommendation by the RSAC that the Track Safety Standards should be revised to apply to all tourist railroads. However, if such a recommendation is the result, FRA may then consider initiating a separate rulemaking to address that issue. The NTSB took the opportunity of this proceeding to express its opinion that the Track Safety Standards should apply to tourist railroads both on and off the general system. Because many issues affecting tourist railroads are still under consideration by FRA, this final rule includes no changes to the Track Safety Standards that are directed specifically to those railroads.

Gage Restraint Measurement System

Historically, railroads assess a track's ability to maintain gage through visual inspections of crossties and rail fasteners. However, the inability of the track structure to maintain gage sometimes becomes apparent only after a derailment occurs. Many railroads throughout the country have successfully tested the GRMS, which was developed under a joint FRA/industry research project.

Accident statistics taken from FRA's Annual Accident/Incident Bulletins reveal that from 1985 through 1995, reportable wide gage derailments from defective crossties and fasteners totaled 2,232 instances and cost the industry over 60 million dollars in damages.

Current crosstie and fastener maintenance techniques rely heavily on visual inspections by track inspectors, whose subjective knowledge is based on varying degrees of experience and training. The subjective nature of those inspections sometimes creates inconsistent determinations about the ability of individual crossties and fasteners to restrain track gage. Crossties may not always exhibit strong indications of good or bad condition. If a crosstie in questionable condition is removed from track prematurely, its maximum service life is unnecessarily shortened resulting in added maintenance costs for the railroad. Yet, a crosstie of questionable condition left too long in track can cause a wide-gage derailment with its inherent risk of injury to railroad personnel and passengers and damage to property. In many instances of gage failure caused by defective crossties and/or fasteners, the static or unloaded gage is within the limits prescribed by the current track standards. However, when a train applies an abnormally high lateral load to a section of track that contains marginal crosstie or fastener conditions, the result is often a wide gage derailment.

In 1993, FRA granted CSX Transportation a waiver of compliance for the purpose of conducting a test program to evaluate the GRMS performance-based standard using FRA's research vehicle, in lieu of existing crosstie and rail fastening requirements, on nearly 500 miles of various track segments. The experience gained under this waiver has provided FRA with the opportunity to continually make adjustments to the conditional

requirements of the waiver to the point where the technology has proven itself to be a more consistent method of objectively determining crosstie and fastener effectiveness. FRA believes the technology is now ready to be deployed within the industry.

The Track Working Group could not reach consensus about how the revised Track Safety Standards should address GRMS technology. The RSAC therefore recommended that a small task group continue evaluating the possibility of developing GRMS standards for broader application within the industry. Nevertheless, some parties submitted comments to the NPRM concerning the use of GRMS. The NTSB recommended that the revised standards incorporate the use of advanced track inspection technologies, such as track geometry cars, GRMS, light-weight loading fixtures, and state-of-the-art rail inspection methods for internal rail defects. In its comments to the NPRM, the BMWE reiterated its position that GRMS technology be used in conjunction with current inspection requirements. The AAR, in its comments, repeated its position that the revised Track Safety Standards should allow alternate inspection procedures that would permit railroads to use some combination of geometry cars, measurement equipment and instrumentation such as GRMS, hyrail inspections, and other means of inspecting in place of the required visual inspections. At the publication of this final rule, the task group continues to work to reconcile the differences and reach a consensus on what type of GRMS provision would be most effective. FRA, for its part, is still examining the points made for and against incorporation of a GRMS provision and is not prepared to resolve the issue at this time. However, FRA anticipates coming to resolution in the near future. All of the relevant issues appear to have been identified and discussed in this proceeding.

High Speed Rail Standards

The current Track Safety Standards include six classes of track that permit passenger and freight trains to travel up to 110 m.p.h. Passenger trains have been allowed to operate at speeds over 125 m.p.h under conditional waiver granted by FRA. This final rule adds three new classes of track that designate standards for track over which trains may travel at speeds up to 200 m.p.h. Standards for high speed track classes will be contained in a new Subpart G of Part 213 which will cover track Classes 6 through 9. The new subpart is intended to function as ''stand alone'' regulations governing any track identified as belonging to one of these higher classes. In other words, the track owner needs to refer only to Subpart G for compliance with the Track Safety Standards for track over which railroads operate trains at the speeds associated with the high speed track classes. However, if that same track does not meet the standards in Subpart G at any time, the other subparts (A through F) apply.

These track standards constitute only one of several components comprising a regulatory program permitting trains to travel at high speeds. FRA also may address high speed issues in regulations outside of Part 213, such as emergency preparedness, wheel conditions, braking systems, and grade crossings. These track standards are an integral part of that larger regulatory scheme.

FRA's approach to track safety standards for high speeds is based on the fundamental principle that vehicles in the high speed regime must demonstrate that they will not exceed minimum vehicle/track performance safety limits when operating on specified track. In addition, railroads must monitor the vehicle/track system to ensure that the safety limits will be met under traffic conditions.

A panel of experts in high speed rail transportation worked with the Track Safety Working Group to provide recommendations for vehicle/track performance limits and track geometry. The panel identified acceleration and wheel/rail force safety criteria by reviewing technical studies, considering foreign experience and practices, and performing independent computer simulation and analytical studies. Once it identified vehicle/track performance limits, the panel developed specific geometry safety criteria. The panel also recommended requirements necessary for track structure to sustain the forces generated by vehicles at high speeds.

In developing this final rule, FRA sought out the best available technical data about dynamic performance of vehicle/track systems to devise safety standards that are practical to implement. The high speed standards in this notice provide for the qualification of vehicles; geometry standards for gage, surface, and alinement; track structure; and inspection requirements for both automated and visual inspections. While some of the sections in the new Subpart G are identical, or nearly identical, to their counterparts in other sections of the regulation, the standards for high speed operations generally differ markedly from those for the lower track classes which cover a much broader range of railroad vehicles. Several sections have no counterpart in the standards for the lower classes of track because they address issues unique to the high speed environment. Other sections are simply modifications of the requirements for the lower track classes.

Comments to the new Subpart G proposed in the NPRM came from Amtrak, the NTSB, Bombardier GEC Alsthom Consortium, Union Switch and Signal, and the Director of Ground Transportation of the French Ministere de l'Equipment des Transports et du Logement. The commenters were generally supportive of the new standards, but they offered suggestions for modifying some sections in the subpart. Their specific comments are addressed in this notice under segment designated as ''Section by Section Analysis.''

A representative for the Florida Overland eXpress responded to the NPRM with a request that FRA remove from the final rule reference to Florida Overland eXpress's plans to operate trains at very high speeds. Florida Overland eXpress petitioned FRA in 1996 for a Rule of Particular Applicability for its proposed operation. Such a rule would include a variety of railroad safety regulations, including track safety regulations, that would apply only to the Florida Overland eXpress. FRA issued a Notice of Rule of Particular Applicability, published on December 12, 1997. *See* 62 FR 65478. Florida Overland eXpress objected to a reference to that operation in the NPRM because this rule of general applicability will not apply to its operation. FRA agrees that the reference in the NPRM to the Florida Overland eXpress, without explanation of its unique circumstances, may mislead others into believing that this rule will apply to that operation. It will not.

Following the closure of the comment period for the NPRM (September 15, 1997), the Volpe National Transportation Systems Center (VNTSC) issued a working paper entitled ''Evaluation of Proposed High Speed Track Surface Geometry Specification,'' dated December 1, 1997. The working paper evaluated the response of different high speed locomotive designs to track profile geometry variations. Because the VNTSC working paper contained relevant and useful information for this final rule but was not available at the time of the publication of the NPRM, FRA placed the paper in the docket for this proceeding and issued a special notice on December 12, 1997, inviting public comment on its content. *See* 62 FR 65401. The comment period for the

VNTSC working paper expired on December 22, 1997. FRA received only one response to the special notice. The AAR noted that it would not be able to provide comment on the VNTSC working paper without knowing how FRA would use the report to set the geometry standards for the high speed classes of track.

Torch Cut Rails

Torch cutting rail, a practice that was widespread in the railroad industry until a few years ago, is now used by most railroads only for emergency repairs in Classes 3 through 5 track. Technology has advanced to the point where cutting rail with the various types of rail saws that are readily available is more efficient than torch cutting. FRA lacks reliable data on the number of existing torch cuts. The railroads report that torch cuts no longer exist on Class 6 track, and the torch cuts remaining in Class 5 track nationwide probably number ''in the hundreds.'' Nevertheless, torch cuts from years ago when the practice was more prevalent still exist and are believed to pose a safety hazard.

In 1983, following its investigation of an Amtrak derailment in Texas, the NTSB recommended that torch cuts be removed and that trains move at only 10 m.p.h. over torch cuts made in emergency situations or as a preparatory step in field welding. It should be noted, however, that the rail involved in the Texas accident had a type of high alloy content which the industry now recognizes as inferior. It is no longer used in the industry.

Because rails that have been torch-cut have a greater tendency to develop fractures in the short term, the NPRM proposed that the practice of torch-cutting rails in Classes 3 through 5 track should be prohibited in the future except for emergency temporary repairs. The NPRM further proposed that existing torch cuts in Class 3 track over which regularly scheduled passenger trains operate should be inventoried and any torch cuts that are found later but are not listed on the inventory must be removed. Torch cuts in Class 4 track must be removed within two years of the effective date of this final rule, and torch cuts in Class 5 track must be removed within one year. Because torch cuts existing on yard tracks and main tracks where trains operate at slow speeds (Classes 1 and 2) do not pose as high a risk, the NPRM proposed that existing torch cuts in Classes 1 and 2 track be allowed to remain.

In commenting on the NPRM, the NTSB suggested that torch cuts should be prohibited and eliminated from all track in classes above Class 1, and movement over torch cuts should be restricted to 10 m.p.h. The BMWE commented that torch cutting should be prohibited in all classes above Class 2, and that existing torch cuts in Class 2 track should be removed within a reasonable time. The AAR commented that the torch cut provision should simply prohibit torch cutting in Classes 3 through 5 track. However, the AAR further stated that it generally supports the NPRM and offered this suggestion to be considered only in the event FRA decides to change the proposed provision in accordance with the comments of other RSAC participants who helped draft the provision and then later withdrew support of the RSAC recommendations.

This final rule adopts the proposed rule as drafted by the Track Working Group, approved by majority consensus of the RSAC, and proposed in the NPRM. The comment by the NTSB, that torch cuts should be removed from any track class above Class 1, is based upon the NTSB's investigation of the 1983 Amtrak derailment in Texas. However, FRA's analysis of the derailment indicates that the high alloy content of the rail at the site of the accident played a larger part in causing the derailment than did the torch cut. Therefore, FRA is not persuaded by the NTSB's analysis. The BMWE offered no clear explanation of its proposal to prohibit all torch cuts in track classes above Class 2. Similarly, FRA was not persuaded by AAR's argument that accident statistics fail to support a torch cut regulation that requires anything more than a prohibition against any future torch cutting in track classes above Class 3. FRA believes that existing torch cuts in the higher classes of track may pose a danger of derailment.

Other Issues

Plant Railroads and Industrial Spurs

In general, FRA has elected not to exercise jurisdiction over the safety of railroads that conduct their operations exclusively within an industrial or military installation. FRA chose this self-imposed limitation because such operations have not demonstrated the same degree and frequency of track problems found on tracks in the general system which are subject to heavier tonnages and more frequent use. Nevertheless, FRA recognizes its responsibility for the safety of railroad employees and operations inside such facilities where a general system railroad provides service on that property, either by picking up and placing cars for transportation in interstate commerce or by switching for the plant. The same responsibility applies to operations on privately owned industrial spurs used exclusively by a main line railroad to serve an industry.

The applicability section of the current Track Safety Standards (§ 213.3) excludes track ''located inside an installation which is not part of the general railroad system of transportation.'' This broad statement implies that the track standards do not apply anywhere inside a plant, regardless of who operates there or the type of operations that occur on the plant track. However, § 213.3 must be read in conjunction with 49 C.F.R. Part 209, Appendix A, which explains that the track owner of any plant railroad trackage over which a general system railroad operates is responsible for the condition of track used by the general system railroad. With the entrance of a general system railroad, the plant does not become part of the general system, but it does lose some of its insularity as to that part of the track used by the general system railroad.

Since the enactment of the Federal Railroad Safety Act of 1970, FRA has had at its disposal statutory authority to issue emergency orders to repair or discontinue use of industrial or plant trackage should the agency find that conditions of the track pose a hazard of death or injury. *See* 49 U.S.C. § 20901. It is FRA's opinion that this emergency order authority is sufficient power to ensure track safety within plants, as well as other installations (*e.g.,* military installations). However, if conditions or events in the future tend to demonstrate that track safety within plants or installations should be more specifically regulated, FRA will seek to change the applicability of this Part in a future rulemaking. This final rule leaves the application section of the Track Safety Standards unchanged.

Train Speed/Preemption

Under the current Track Safety Standards, FRA has only an indirect role in determining speed limits. Railroads set train speed in their timetables or train orders. Once a railroad sets a train speed, it must then maintain the track according to FRA standards for the class of track that corresponds to that train speed. The signal and train control regulations also fix limits on train speed based upon the type of signal system that is in place. If the railroad fails to comply with track or signal system requirements for speed at which trains are operated, the railroad is subject to penalty.

FRA's current regulations governing train speed do not afford any adjustment of train speeds in urban settings or at grade crossings. This omission is intentional. FRA believes that locally established speed limits may result in hundreds of individual speed restrictions along a train's route, increasing safety hazards and causing train delays. The safest train maintains a steady speed. Every time a train must slow down and then speed up, safety hazards, such as buff and draft forces, are introduced. These kinds of forces can enhance the chance of derailment with its attendant risk of injury to employees, the traveling public, and surrounding communities.

FRA always has contended that Federal regulations preempt any local speed restrictions on trains. Section 20106 of Title 49, United States Code (formerly 45 U.S.C. § 434) declares that—

> [l]aws, regulations, and orders related to railroad safety shall be nationally uniform to the extent practicable. A State may adopt or continue in force an additional or more stringent law, regulation, or order related to railroad safety when the law, regulation, or order—(1) is necessary to eliminate or reduce an essentially local safety hazard; (2) is not incompatible with a law, regulation, or order of the United States Government; and (3) does not unreasonable burden interstate commerce.

FRA's long-held belief that Part 213 preempts local speed laws was verified by the U.S. Supreme Court in 1993 in the case *CSX* v. *Easterwood*, 507 U.S. 658 (1993). The Court held that legal duties imposed on railroads by a state's common law of negligence fall within the scope of preemption provision of 49 U.S.C. 20106, which preempts any state ''law, rule, regulation, order or standard relating to railroad safety.'' The Court said that preemption of such state laws ''will lie only if the federal regulations substantially subsume the subject matter of the relevant state law.'' *Easterwood*, 664. However, the Court further stated that because Part 213 ties certain track requirements to train speed, it should be viewed as ''covering the subject matter'' of speed limits.

Notwithstanding some of the language in *Easterwood* that a cursory reading may otherwise indicate, FRA has never assumed the task of setting train speed. Rather, the agency holds railroads responsible for minimizing the risk of derailment by properly maintaining track for the speed they set themselves. For example, if a railroad wants its freight trains to operate at 59 m.p.h. between two certain locations, it must maintain the tracks between those locations to Class 4 standards.

Moreover, there are significant safety reasons for facilitating the fastest transit of trains throughout the railroad system. For example, the risk of releases of hazardous materials is reduced by minimizing the time such shipments spend in transportation. It would be poor public policy to allow local governments to attempt to lower their risk by raising everyone's risk and by clogging the transportation system. Railroads have strong economic motives to minimize the time shipments spend in transportation, so public safety and employee safety are best served by setting and enforcing the standards railroads must meet to travel at particular speeds.

In recent years, FRA has encountered increasing pressure from communities along railroad rights-of-way to set slower train speeds on main tracks located in urban areas. They typically cite the inherent dangers of grade crossings, pedestrian safety, as well as the risk of derailments of rail cars containing hazardous materials.

As to grade crossings, FRA has consistently maintained that their danger is a separate issue from train speed. The physical properties of a moving train virtually always prevent it from stopping in time to avoid hitting an object on the tracks regardless of the speed at which the train is traveling. Prevention of grade crossing accidents is more effectively achieved through the use of adequate crossing warning systems and through observance by the traveling public of crossing restrictions and precautions. Therefore, FRA continues to sponsor and/or support initiatives to improve safety at grade crossings under the Department of Transportation's Grade Crossing Action Plan. These initiatives are geared towards enhancing enforcement of traffic laws at crossings, closing unneeded crossings, enhancing rail corridor crossing reviews and improvements, expanding public education and Operation Lifesaver activities, increasing safety at private crossings, improving data and research efforts, and preventing rail trespassing.

In January, 1995, FRA implemented regulations for maintenance, inspection and testing of warning devices at crossings, such as lights and gates. *See* 59 FR 50086. The agency also implemented regulations requiring certain locomotives to be equipped with auxiliary lights making trains more visible to motorists, railroad employees, and pedestrians. *See* 61 FR 8881. FRA believes that these measures are more effective approaches to enhancing safety at grade crossings than an attempt to design speed limits for each geographic situation.

FRA received no comments on this issue following a similar discussion of the issue in the NPRM.

Vegetation

The vegetation control requirements of Part 213 currently deal with fire hazards to bridges, visibility of railroad signs and signals, interference with normal trackside duties of employees, proper functioning of signal and communication lines, and the ability to inspect moving equipment (''roll by'' inspections). The regulation does not address the issues of motorists' and pedestrians' ability to see warning devices at highway-rail crossings.

Since 1978, accidents and fatalities at highway-rail grade crossings have decreased dramatically due to engineering improvements at individual crossings, education of the public, and greater enforcement of highway traffic laws. Nevertheless, FRA finds that the present loss of life, injuries, and property damage are still unacceptable. Projections for 1997 based upon nine months of preliminary data show that 441 people were killed, and 1,525 suffered serious injuries in grade crossing accidents. Second only to trespasser fatalities as a leading cause of death in the railroad industry, highway-rail collisions far out-number fatalities to railroad employees and passengers.

In lengthy discussions about vegetation at grade crossings, the Track Working Group quickly realized that the issue requires the expertise of entities not represented on the Track Working Group or RSAC, *e.g.*, state and federal highway designers, traffic engineers, as well as representatives of local jurisdictions with grade crossings. The NPRM generated no comments concerning the issue of vegetation at grade crossings. FRA agrees with the assessment reached by the Track Working Group that the issue requires the judgment of experts in other transportation arenas. Therefore, this final rule adds only one requirement for railroads in maintaining vegetation. Under this rule, railroads are required to clear vegetation away from signs and signals on railroad rights-of-way at grade crossings. The additional language is intended only to cover the clearing of vegetation at highway-rail grade crossings to provide adequate visibility of railroad signs and signals to the traveling public. It is not intended to cover or preempt state or local requirements for the clearing of vegetation on railroad rights-of-way at highway-rail grade crossings, nor is it

intended to dictate standards for surrounding landowners.

Because concern about this issue remains, the FRA Administrator has recommended that the Department of Transportation initiate a joint regulatory proceeding by FRA and the Federal Highway Administration to address vegetation maintenance and sight distances for motorists at grade crossings. Should the Department of Transportation decide not to initiate such a regulatory project, FRA will then consider the next appropriate action which may include launching its own regulatory proceeding.

Metric System

In the 1992 ANPRM, FRA requested comments in response to a proposal to create a dual system of measurements, English and metric, for inclusion in these regulations. Responses were varied. Some commenters suggested that FRA implement metric standards, while others recommended that a dual system would be better. Still others argued that the addition of metric standards, whether as a single standard or in a dual system with English standards, would cause confusion in the industry. They added that computerized recordkeeping would have to be re-programmed at a significant expense.

The RSAC did not recommend the addition of metric standards in this proceeding. Although the issue was raised in the NPRM, it generated no comments. FRA concludes that the introduction of metric values into the regulations is not appropriate at this time.

Section by Section Analysis—Track Classes 1–5

The Federal Track Safety Standards, until now, included only six classes of track representing speeds up to 110 m.p.h. The regulations applied to all of the classes. This final rule separates the classes of track into two general categories: Classes 1 through 5 for speeds up to 90 m.p.h. (80 m.p.h. for freight) and Classes 6 through 9 for speeds above 90 m.p.h. (80 m.p.h. for freight). Subparts A through F apply to Classes 1 through 5, as they always have. However, the new Subpart G applies exclusively to Classes 6 through 9. This separation of the classes of track is designed for better ease of use. Owners of track over which high speed trains operate need to refer only to Subpart G for almost all of the relevant regulations. (The exceptions are § 213.2, Preemptive effect; § 213.3, Application; and § 213.15, Penalties.) On the other hand, track owners over which train speeds do not exceed 90 m.p.h. continue to refer to Subparts A through .

Class 6 is included in the category for high speed track, governed by Subpart G, because the safety issues associated with that class of track more closely resemble those associated with the higher classes.

Section 213.1—Scope of the Part

Proposed rule: An amendment to this section would eliminate the word ''initial.'' When the Track Safety Standards were first published in 1971, they were referred to as ''initial safety standards'' because they were the first Federal standards addressing track safety. Twenty-five years and several amendments later, the current Track Safety Standards are no longer initial standards. Therefore this amendment eliminates a mischaracterization of the standards by removing the outdated descriptive ''initial.''

Comments: Comments received supported the proposed amendment.

Final rule: The section incorporates the change as proposed in the NPRM and adds a sentence to distinguish the applicability of Subpart G from the applicability of Subparts A through F. Subpart G applies to track over which trains are operated at speeds in excess of those permitted over Class 5 track, a maximum of 80 m.p.h. for freight trains and 90 m.p.h. for passenger trains. Subpart G is designed to be mostly comprehensive, so that a railroad operating at speeds above Class 5 maximum speeds may refer to Subpart G for all of the substantive track safety requirements for high speed rail. Such a railroad needs to refer to the earlier sections of the Track Safety Standards only for the general provisions at § 213.2 (preemptive effect), § 213.3 (application), and § 213.1 (Penalties). On the other hand, railroads which never operate at speeds in excess of the maximum Class 5 speeds need not refer to Subpart G at all.

The final rule also adds language to this section to state that railroads are not restricted from adopting and enforcing more stringent track safety requirements as long as they are not inconsistent with the track safety standards in this Part. This statement is consistent with the earlier statement that these regulations are minimum requirements.

Section 213.2—Preemptive Effect

Proposed rule: This section is added to Part 213 to indicate that states cannot adopt or continue in force laws related to the subject matter covered in this rule, unless such laws are needed to address a local safety hazard and they impose no undue burden on interstate commerce. This section is consistent with the mandate of 49 U.S.C. 20106, formerly § 205 of the Federal Railroad Safety Act of 1970. Although the courts ultimately determine preemption in any particular factual context, this section provides a statement of agency intent and promotes national uniformity of regulation in accordance with the statute.

Comments: Comments received supported the proposed amendment.

Final rule: The section is modified slightly so that the language more closely corresponds to the language of the statute. *See* 49 U.S.C. 20106.

Section 213.3—Application

Proposed rule: This section was not proposed to be amended. The Track Working Group discussed amending subsection (b) to reference Appendix A of Part 209 in an effort to clarify FRA's safety policy toward trackage used by general system railroads within the confines of installations. According to Appendix A of Part 209, a plant does not become a general system railroad, subject to all of the attendant safety requirements applied to such railroads, simply because a general system railroad operates over a portion of the plant trackage. Nevertheless, a plant owner is held liable for the condition of any plant trackage over which a general system railroad operates. Under this policy, FRA will not hold plant owners responsible for compliance with ancillary track safety provisions, such as the requirements for recordkeeping or inspection frequencies. However, FRA will judge the safety of the plant railroad against the substantive safety requirements in those standards to assess the need to invoke its emergency order authority against the plant owner.

The Track Working Group advised that a reference in Part 213 to Appendix A of Part 209, which is merely a statement of FRA policy, could have the effect of making all provisions of Part 213, including those ancillary provisions, enforceable against thousands of plant owners, at least to the extent general system railroads operate within plant borders. Such a result would be more far-reaching than intended by the RSAC.

Comments: One commenter suggested that the application of Part 213 be extended to cover standard gage tourist railroads which operate off the general system and meet the FRA's test for insularity. This commenter also suggested that the agency consider developing track safety standards for non-standard gage tourist railroad operations.

Final rule: This section is amended to conform the discussion of jurisdiction over rapid transit service to the statute. See 49 U.S.C. 20102. The statute has been amended since part 213 was issued, but § 213.3(b)(2) was never amended to conform to the statute. The Track Safety Standards will still exclude urban area rapid transit systems that are unconnected to the general system. This change is not intended make the Track Safety Standards applicable to rapid transit whose only connection to the general system is a switch permitting receipt of shipments from the general system.

In response to concerns expressed by and about tourist railroads, FRA proffered, and the RSAC accepted, a task to study tourist railroad concerns. The RSAC has established a working group to perform the task. It is comprised of agency and tourist railroad industry representatives who are analyzing the industry's unique aspects and formulating recommendations for appropriate regulation of that specialized industry. Therefore, the NPRM proposed no changes in that regard.

While FRA does not think a reference to Appendix A to Part 209 would have the effect feared by the Track Working Group, FRA declines to exercise its jurisdiction over plant railroads at this time because the safety issues now presented on their track do not warrant the allocation of agency resources that would be diverted from matters presenting greater safety risks. The agency continues to have safety jurisdiction over those railroads and may invoke its statutory emergency authority if it deems that necessary in order to safeguard anyone from the hazard of death or personal injury.

Section 213.4—Excepted Track

Proposed rule: The NPRM proposed to maintain the provision for excepted track with added restrictions for its use and maintenance. Since its inception in 1982, the excepted track category has become an economic issue for some small railroads, particularly short line railroads and low volume shippers. It allows railroads to continue to use, on a limited basis, low-density trackage that does not earn sufficient revenue to justify the expense of maintaining it to higher track standards. It allows short lines to acquire and use trackage that may have been abandoned by larger railroads, thereby preserving rail service to shippers and avoiding the necessity of shifting traffic over those lines from moving to some other, perhaps more hazardous, means of transport.

Because the majority of reportable derailments on excepted track are track-caused, and the majority of this total are wide gage-related, the NPRM proposed to institute a requirement that gage must not exceed of 58¼″ on excepted track. This requirement would apply to the actual gage measurement itself, and would not extend to the evaluation of crossties and fasteners which provide the gage restraint. A clarification was added to the inspection requirements on excepted track which specifically reference turnout inspections required under this section.

The NPRM also proposed to include a requirement that railroads notify FRA at least 10 days before removing trackage from excepted status. This provision is intended to prevent the practice FRA has witnessed in the past by some railroads who remove trackage from excepted status only long enough to move a passenger excursion train or a train with more than five cars containing hazardous materials. Furthermore, the NPRM included an edit to § 213.4(e)(2) changing the word ''revenue'' to ''occupied'' in describing passenger trains prohibited from operating over excepted track. This change addresses a misconception by some railroads that they could operate passenger excursion trains over excepted track as long as they did not charge passengers admission for a ride. The proposed change clarifies that the prohibition is directed toward all passengers but is not meant to include train crew members, track maintenance crews, and other railroad employees who must travel over the track to attend to their work duties.

Comments: Comments received generally supported the proposed amendments to the excepted track regulation. However, several commenters proposed that additional requirements and restrictions should be incorporated into the regulation. Proposals included a total prohibition of hazardous materials shipments, additional restrictions on where excepted track could be utilized, additional minimum safety standards, and a time limit for length of time a track could remain in excepted status.

Final rule: In preparing its recommended proposed rule, the Track Working Group discussed at length the same requirements and restrictions suggested for inclusion into this final rule by commenters. The final rule includes additional regulatory control over abuses of the excepted track provision which have been documented in the past. The final rule also prescribes a minimum safety standard for gage that addresses the major causal factor associated with track-caused derailments on excepted track.

FRA rejected the suggestion that the provision should include a prohibition of all hazardous material shipments. Many small short line railroads who operate over excepted track haul hazardous materials on a regular basis. A general prohibition would cause many of these railroads to close operation, and the hazardous materials would be hauled by trucks over public highways. Similarly, a restriction on the length of time track may remain in excepted status, and a restriction on where excepted track could be utilized, would place an undue burden on many short line railroads who operate exclusively on excepted track. Statistics show that 87 track-caused reportable accidents occurred on 8,000 to 9,000 miles of excepted track in five years. These numbers, in FRA's judgment, do not justify implementing restrictions over-burdensome to small railroads.

FRA considered implementing minimum safety standards, in addition to the new gage and switch requirements. However, the ASLRA estimated that the cost to short line railroads to improve excepted track to Class 1 standards would cost the short line industry some $230 million. FRA believes that this final rule provides needed additional measures of safety for excepted track while maintaining the regulatory relief the excepted track provision provides, but under more restrictive conditional and operational requirements.

Section 213.5—Responsibility of Track Owners

Proposed rule: The NPRM proposed to change subsections (c) and (d) to modify the way in which track owners may assign compliance responsibility to another entity. Under the current regulations, a track owner may petition the Federal Railroad Administrator to recognize another party as the one primarily responsible for the maintenance and inspection of the owner's track. This provision is intended to facilitate compliance by track owners whose track is leased to another entity for operation. Often track owners (*e.g.*, municipal communities, county governments) do not have the necessary expertise to maintain compliance with Federal track standards, but their track lessees do. Thus, track owners can successfully petition FRA for reassignment of primary responsibility by providing certain information about the assigned party and the relationship of the assigned party to the track owner. When such a petition is approved by FRA, the

assigned party becomes responsible, along with the track owner, for compliance with Part 213.

The change for these subsections eliminates the approval process by FRA, shown in years past to be the cause of unnecessary paperwork. Records show that FRA has approved almost every such petition it has reviewed. Under the subsection proposed in the NPRM, a track owner could reassign responsibility to another entity simply by notifying FRA's regional administrator for the FRA region in which the track is located. The notification would include the same information required for the petitions under the current standards. However, FRA would discontinue its practice of publishing in the **Federal Register** the petitions for reassignment, along with requests for public comment. The reassignments would no longer be reviewed by FRA's Railroad Safety Board.

FRA believes that the change would not diminish track safety. Although the intent of the original subsection was to give FRA some control over who should be responsible for maintaining track, the practical application of the subsection has shown that such control by the agency is unnecessary. Rather, it is more important for FRA to know what party or parties to hold responsible for compliance with track safety standards. Therefore, the subsection (c) would require notification to the agency of reassignments of track responsibility, but it would no longer require approval by FRA now required in subsection (d). The text currently shown as subsection (d) would be eliminated.

The NPRM also proposed one minor change in current subsection (e), substituting the name ''Surface Transportation Board'' for ''Interstate Commerce Commission.'' This substitution is meant to reflect Congress' action in 1995 to eliminate the Interstate Commerce Commission and turn over many of its functions to the new Surface Transportation Board within the Department of Transportation. With the elimination of the current text of subsection (d), this subsection now designated as (e) would become subsection (d).

Comments: Comments received were supportive of these changes.

Final rule: Subsection (f) of this section is added to include in the category of those responsible for compliance with the track standards those who perform the function of complying with the standards, not just the track owner. For example, this addition will hold track maintenance contractors responsible for compliance. This is not inconsistent with past enforcement and it conforms to the authority given FRA by the statute. See 49 U.S.C. 21301 and 1 U.S.C. 1.

Paragraph (e) of this section is changed to correct a typographical error in the NPRM. The correct cite for the Federal law which gives the Surface Transportation Board authority to direct rail service is 49 U.S.C. 11123.

Section 213.7—Designation of Qualified Persons To Supervise Certain Renewals and Inspect Track

Proposed rule: In the past, FRA has interpreted this section in a way that allowed signal maintainers and other railroad employees to pass trains over broken rails or pull-aparts in situations when they were the first on the scene to investigate a signal or track circuit problem. Under this interpretation, the intent of the regulation would not be violated if signal maintainers or others had been given selected training relating to the safe passage of trains over broken rails and pull-aparts. The BMWE, however, has argued that this section was never intended to allow for the partial qualification of personnel on Part 213 standards.

The RSAC recommended the creation of a new subsection (d) which prescribes the manner in which persons not fully qualified as outlined in subsections (a) and (b) of this section may be qualified for the specific purpose of authorizing train movements over broken rails and pull-aparts. Language in the new subsection is specific to employees with at least one year of maintenance of way or signal experience and requires a minimum of four hours of training and examination on requirements related to the safe passage of trains over broken rails and pull-aparts. The purpose of the examination is to ascertain the person's ability to effectively apply these requirements. A railroad may use the examination to determine whether or not a person should be allowed to authorize train movements over broken rails and pull-aparts. However, the examination is not to be used as a test to disqualify the person from other duties.

The maximum speed over broken rails and pull-aparts shall not exceed 10 m.p.h. However, movement authorized by a person qualified under this subsection may further restrict speed over broken rails and pull-aparts if warranted by the particular circumstances. This person must watch all movements and be prepared to stop the train if necessary. Fully qualified persons under § 213.7 must be notified and dispatched to the location promptly to assume responsibility for authorizing train movements and effecting temporary or permanent repairs. The word ''promptly'' is meant to provide the railroad with some flexibility in events where there is only one train to pass over the condition prior to the time when a fully qualified person would report for a regular tour of duty, or where a train is due to pass over the condition before a fully qualified person is able to report to the scene. Railroads should not use persons qualified under 213.7(d) to authorize multiple train movements over such conditions for an extended period of time.

Comments: Comments generally supported the proposed amendments to this section. One commenter argued that only those employees fully qualified under § 213.7 should be designated to authorize train movements over broken rails and pull-aparts. FRA disagrees with this statement. For the narrow purpose of temporarily authorizing train movements over broken rails or pull aparts, a person does not need to be trained in all of the remedial actions included in Part 213, as outlined in § 213.7.

Several commenters suggested that § 213.7 should contain a requirement for the requalification of employees designated to inspect track or to supervise restorations or renewals. A regulation requiring such requalification of designated persons would overlap the existing regulation, as FRA has long held that the requirement to be ''qualified'' is a continuing requirement, not a static one, and it is the responsibility of the track owner to assure that persons designated under this section are qualified at all times. This mandate for qualification is not periodic, it is continuing. FRA will address this issue by issuing a technical bulletin containing ''good practice'' industry guidelines for the requalification of persons designated under § 213.7, as drafted by the Track Working Group.

Final rule: FRA believes that persons who are trained, examined, and periodically re-examined on specific issues relating to the singular function of passing trains over broken rails and pull-aparts at restricted speed does not violate the intent of the Track Safety Standards, nor does this practice compromise safety provided those persons demonstrate to the track owner that they know and understand the requirements on which they were examined.

FRA proposes to re-designate paragraph (d) in the NPRM as paragraph (c) in the final rule. Similarly, paragraph (c) in the NPRM will become paragraph

(d) in the final rule with a reference to ''persons not fully qualified'' for the purpose of maintaining records of those designations. These changes provide for a more orderly structure of the requirements of this section and also recognize FRA's and the railroads ''need to know'' what persons are being designated under this new paragraph for purposes of compliance with this part.

Section 213.9—Classes of Track: Operating Speed Limits

Proposed rule: The NPRM proposed to move Class 6 standards to Subpart G, a new subpart which establishes track safety standards for high speed rail operations. As proposed in the NPRM, the new subpart would consist of Class 6 and three new track classes, Classes 7 through 9, to accommodate train speeds up to 200 m.p.h. The Track Working Group and the RSAC recommended including Class 6 in the high speed standards because that class of track already requires certain heightened maintenance practices not required by the lower classes of track.

Comments: Comments received generally supported the proposed amendment to this section. One commenter suggested that the provision under § 213.9(b) allowing operation for up to 30 days over track not in compliance with Class 1 standards was too liberal, and this option should only be allowed as an upper limit for track under emergency repairs.

Final rule: FRA believes that the option provided the track owner under subsection (b) of this section, to continue operations over track not in full compliance with Class 1 standards, at Class 1 speeds for a period of not more than 30 days, is appropriate, considering the many types of defects that can occur and the various levels of risks associated with these defects. The regulation requires that the person designated under § 213.7(a) who makes the determination to continue operations at Class 1 speeds shall do so only after personally evaluating the immediate circumstances and the associated risks presented by the non-compliance condition, and then determining that operations may safely continue.

However, this provision is not meant to supplant the remedial actions for defective rails prescribed in § 213.113. If a person designated under § 213.7 determines that tracks containing defective rail may continue in use, the rail must be replaced or the remedial action prescribed in the table in § 213.113 must be initiated.

There are several minor editorial changes to this section. In subsection (a), the reference to subsection (c) contained in the NPRM was deleted in the final rule because there is no subsection (c) to this section. The final rule also cross-references the maximum allowable speed for excepted track in the § 213.9(a) table concerning ''Maximum Allowable Operating Speeds.''

Otherwise, this section as proposed, is adopted in this final rule. In grouping Class 6 with Classes 7 through 9, FRA does not suggest, and it would be inaccurate to infer, that Class 6 track or operation of trains over Class 6 track at the speeds permitted is in any way unconventional or unusual. Trains have been run at those speeds for decades.

Section 213.11—Restoration or Renewal of Track Under Traffic Conditions

Proposed rule: An added phrase recommended by the RSAC for the end of this section would clarify a qualified inspector's authority to limit the speed of trains operating through areas under restoration or renewal. In the Track Working Group, the BMWE expressed concern that the current language of the section provides no guidance for track inspectors determining the appropriate speed through restoration areas. The language proposed by the NPRM gives a qualified track inspector discretion to set train speed through a work area, but does not allow the inspector to authorize trains to operate at speeds faster than the maximum speed for the appropriate track class. This change does not represent a change to past interpretation and enforcement of this section; it is merely a clarification of established policy.

Comments: Comments received supported the proposed amendment.

Final rule: The section as proposed is adopted in this final rule.

Section 213.13—Measuring Track Not Under Load

Proposed rule: The proposed rule recommended no changes to this section.

Comments: One commenter suggested that the phrase ''under a loaded condition'' should be more clearly defined.

Final rule: FRA considers that the dynamic loading conditions applied by train operations is implicit in the phrase ''under a loaded condition'' and therefore the final rule is adopted as proposed by the NPRM.

Section 213.15—Penalties

Proposed rule: The NPRM proposed no changes to this section. The section covers all subparts to this part, including the new Subpart G.

Comments: One commenter advised FRA that Appendix B had not been revised to reflect entries for the new § 213.119 addressing Continuous Welded Rail (CWR).

Final rule: The final rule changes this section in several ways. The section is now entitled, ''Penalties'' rather than ''Civil penalties'' because it now includes a provision for criminal penalties. The authority for FRA to initiate criminal penalties is granted by the statute at 49 U.S.C. 21311.

The section also adds language to indicate that ''person'' as used in this section is defined by the statute at 1 U.S.C. 1 and includes, but is not limited to, a railroad, manager, supervisor, official, agent of the railroad, owner, manufacturer, lessor or lessee of railroad equipment or track, independent contractor to the railroad.

The section also changes the maximum penalties FRA is authorized to assess for violations of the provisions of this Part. The maximum penalty is raised from $10,000 to $11,000 for violations, and from $20,000 to $22,000 for willful violations. This change is included to comply with the provisions of the Debt Collection Improvement Act of 1996 which requires Federal agencies to adjust civil monetary penalties to counter inflation's effect of diminishing the impact of these penalties. *See* Pub. L. 104–134, April 26, 1996. According to the Act, the inflation adjustment is to be calculated by increasing the maximum civil monetary penalty by the percentage that the Consumer Price Index for the month of June, 1995, exceeds the Consumer Price Index for the month of June of the last calendar year in which the amount of the penalty was last set or adjusted. The initial adjustment, however, may not exceed 10 percent. Hence, the maximum penalties for violations of this Part are increased by 10 percent. In addition, the minimum civil penalty amount shown in this section is changed from $250 to $500 to conform with Rail Safety Enforcement and Review Act of 1992, codified at 49 U.S.C. 21301.

In further compliance with the Debt Collection Improvement Act, FRA reviewed existing penalties contained in Appendix B of Part 213. After examination of those penalties and FRA's enforcement policies, FRA decided that the existing penalties require no adjustment at this time.

The civil penalties shown in Appendix B of the NPRM did not include penalties for CWR, torch cut rail, new provisions in excepted track or Subpart G. The Appendix B in this final rule includes penalties for the new provisions in the final rule. Because

FRA's civil penalties are statements of policy, notice and comment of these changes were not required.

Section 213.17—Exemptions

Proposed rule: The Track Working Group considered a proposal by the BMWE that this section be eliminated. However, the group agreed that the existing language allowing for the temporary suspension of certain track standards is appropriate and exemptions are necessary for the industry to experiment with alternative methods of compliance and new technology. Further, FRA is required by law to consider appropriately suggested waiver requests and has adopted generally applicable procedures for doing so in 49 CFR Part 211. Therefore, the NPRM recommended that this section be left as currently written.

Comments: No comments received.

Final rule: The title of this section, as well as the language of the section itself, are changed by the replacement of ''exemptions'' with ''waivers.'' This language change makes the section consistent with the language contained in 49 U.S.C. 20103, as well as 49 CFR Part 211.

Section 213.19—Information Collection

Proposed rule: The addition of this section was not proposed in the NPRM.

Comments: No comments were received concerning this addition.

Final rule: FRA adds this section to show which sections of this part have been approved by the Office of Management and Budget (OMB) for compliance with the Paperwork Reduction Act of 1995. See 44 U.S.C. 3501 *et seq.* The requirement for approval by OMB has been added since the Track Safety Standards were first issued. While subsequent revisions to the track standards have received OMB approval, those approvals have not been reflected in the standards themselves.

Section 213.31—Scope

Proposed rule: The Track Working Group discussed this section and recommended that it remain as currently written.

Comments: FRA received no comments.

Final rule: FRA agrees with the recommendation of the Track Working Group and this section as proposed is adopted in this final rule.

Section 213.33—Drainage

Proposed rule: In its 1990 petition for revision of the track standards, the BMWE requested that this section be expanded to include more specific requirements for drainage and water diversion around track roadbeds, addressing water seeping toward the track, water falling upon the roadbed, cross drainage, and the use of geotextiles. The proposal was discussed by the Track Working Group, as was a proposal by the AAR that merely modified the phrase ''clear of obstruction'' to ''sufficiently clear of obstruction.'' The NPRM proposed to follow an RSAC recommendation that the section be left unchanged.

Comments: No comments received.

Final rule: The section as proposed is adopted in this final rule.

Section 213.37—Vegetation

Proposed rule: The NPRM proposed to add a phrase to subsection (b) to include a requirement to clear vegetation from signs and signals along railroad rights-of-way and at highway-rail grade crossings. The current regulation stipulates only that vegetation cannot interfere with visibility of railroad signs and signals. Because the scope of Part 213 limits vegetation requirements to railroad property, this proposal was not intended to be an attempt to dictate standards for surrounding landowners. The additional language was intended only to cover the clearing of vegetation at highway-rail grade crossings to provide adequate visibility to the traveling public of railroad signs and signals; it was not intended to cover or preempt state or local requirements for the clearing of vegetation on railroad rights-of-way at highway-rail grade crossings.

Comments: Comments received supported the proposed amendment.

Final rule: The final rule includes one minor change to the rule text of this section to correct an error regarding the effective date for compliance with the change. In the NPRM, paragraphs (b)(1) and (2) were both exempt from compliance for a period of one year following the effective date of the rule. The requirement for controlling vegetation along the right-of-way so that it does not obstruct the visibility of railroad signs and signals, as outlined in paragraph (b)(1), has been a requirement of the Track Safety Standards since their inception. The final rule will clarify that only paragraph (b)(2), which was added to enhance visibility to the traveling public of railroad signs and signals at highway-rail crossings, will be exempt from compliance for one year following the effective date of the rule.

Section 213.51—Scope

Proposed rule: The Track Working Group discussed this section and recommended that it remain as currently written.

Comments: FRA received no comments.

Final rule: FRA agrees with the recommendation of the Track Working Group and this section as proposed is adopted in this final rule.

Section 213.53—Gage

Proposed rule: The proposed rule recommended no changes to this section.

Comments: No comments received.

Final rule: The final rule includes one minor editorial change to this section. The section now cross-references the maximum allowable gage for excepted track in the gage table under § 213.53(b) which was inadvertently omitted in the NPRM.

Section 213.55—Alinement

Proposed rule: The NPRM introduced a 31-foot chord requirement, in addition to the present 62-foot chord requirement, for measuring alinement on curves in Classes 3 through 5 track. The RSAC, on advice from the Track Working Group, recommended this addition to control transient short wavelength variations in alinement. This control was considered necessary to introduce an averaging approach for the application of the V_{max} formula which determines the maximum allowable operating speed for each curve. The change in the application of the V_{max} formula is discussed in § 213.57 of this notice.

Comments: Comments received supported the proposed amendment.

Final rule: The section as proposed is adopted in this final rule.

Section 213.57—Curves; Elevation and Speed Limitations

Proposed rule: The existing subsection (a) limits the design elevation on curves to a maximum of six inches. However, this subsection also provides for a deviation from this design elevation, which is contained in the § 213.63 table. For a curve elevated to six inches in Class 1 track, the allowable deviation would be three inches and therefore any point in that curve could have as much as nine inches of elevation and remain in compliance. For a similar situation in Class 3 track, any point in that curve could have as much as seven and three-fourths inches of elevation and still be in compliance. For modern rail cars with a high center of gravity, low speed curve negotiation under excessive levels of superelevation places the vehicle in an increased state of overbalance. This condition creates the possibility of wheel unloading and

subsequent wheel climb when warp conditions are encountered within the curve.

The Track Working Group considered the characteristics of the present-day vehicle fleet and concluded that a lower limit on maximum elevation in a curve should be prescribed in the regulations. Therefore, the NPRM proposed to revise subsection (a) to limit the amount of crosslevel at any point in a curve to not more than eight inches on Classes 1 and 2 track, and not more than seven inches on Classes 3 through 5 track.

Subsection (b) of this section addresses the maximum allowable operating speed for curved track. The equilibrium speed on a curve is the speed where the resultant force of the weight and centrifugal force is perpendicular to the plane of the track. The American Railway Engineering and Maintenance-of-way Association's (AREMA) Manual of Engineering, Chapter 5, states that passenger cars have been shown to ride comfortably around a curve at a speed which produces three inches of underbalance, or otherwise stated, three inches less elevation than would be required to produce equilibrium conditions. The AREMA Manual sets forth a formula based on the steady-state forces involved in curve negotiation which is commonly referred to as the V_{max} formula. This formula considers the variables of elevation, curvature, and the amount of unbalanced elevation or cant deficiency in determining the maximum curving speed. (Note: FRA considers the terms ''unbalanced elevation'' and ''cant deficiency'' to be interchangeable.) The present standards under paragraph (b) limit curving speed based on a maximum of three inches of unbalance or cant deficiency and is commonly referred to as the ''three-inch unbalance formula.'' FRA has granted waivers for other levels of unbalance on specified equipment.

Over the years, railroad engineers have differed as to the application of this three-inch unbalance formula. Some engineers have suggested the designed elevation and curvature should be used to calculate the maximum operating speed around a curve. Other engineers recommend that an average of the entire curve or segment of the curve better recognizes situations where steady-state conditions change. For example, the elevation may be decreased through a road crossing to accommodate road levels and then increased beyond the crossing.

Recognizing the origin and purpose of the V_{max} formula, the Track Working Group recommended that an average of the alinement and crosslevel measurements through a track segment in the body of the curve should be used in the formula to arrive at the maximum authorized speed. This approach recognizes the ''steady-state'' purpose of the formula. Transient locations (points) are covered by the alinement and track surface tables. Normally, approximately 10 stations are used through the track segment, spaced at 15′6″ apart. If the length of the body of the curve is less than 155 feet, measurements should be taken for the full length of the body of the curve.

This uniform or averaging technique over the 10 stations through the track segment is consistent with the concept used by the vehicle/track dynamicists who discuss ''g'' levels in steady-state conditions, often considered to be one or two seconds. At 80 m.p.h., a vehicle will have traversed approximately 118 feet of track in one second. Measurements taken over 155 feet (10 stations at 15′6″) provide the necessary distance to determine the behavior of the vehicle over the one- or two-second steady-state interval.

Analysis has shown that, although application of the V_{max} formula on a point-by-point basis is overly conservative, it does provide for the coverage of certain combinations of alinement and crosslevel deviations in Classes 3 through 5 track which could result in wheel climb derailments. However, further analysis has shown that these transient short-wavelength anomalies can be covered by the introduction of a 31-foot chord to the alinement table contained in § 213.55.

The Track Working Group also recommended the addition of new paragraphs (c), (d), (e), and (f) which will permit curving speeds based on four inches of unbalance or cant deficiency for certain categories of equipment that demonstrate safe curving performance at this level of unbalance. The means of qualification is a basic procedure known as a ''static lean'' test that has been used many times in recent years for the testing of equipment for operation at higher cant deficiencies. Although four inches of cant deficiency is usually applied to passenger trains, other types of equipment with comparable suspension systems, centers of gravity, and cross-sectional areas may perform equally well. Standard freight equipment, however, typically does not have the prerequisite vehicle characteristics which would allow curving speeds based on more than three inches of cant deficiency. The Track Working Group recommended that FRA review the information provided by the track owner or operator to verify safe curving performance and approve the proposal before the vehicles are operated at four inches of cant deficiency.

The NPRM proposed to revise Appendix A, which currently contains a table specifying the maximum allowable operating speed for each curve based on three inches of cant deficiency. Under this proposed change, Appendix A would be amended to include two tables. Table 1 would be identical to the current table, while Table 2 would specify curving speeds based on four inches of cant deficiency.

Comments: Comments received supported the proposed amendments.

Final rule: FRA adds paragraph (g) to this section to afford track owners or railroads operating above Class 5 speeds an option to qualify equipment at cant deficiencies greater than four inches in lower track classes. Track owners or railroads operating under the provisions of Subpart G may exercise the option on lower track classes (Classes 1 through 5) that are contiguous with high speed territory without first petitioning FRA for a waiver from compliance with the other provisions of § 213.57.

Under paragraph (g), a track owner or railroad operating under Subpart G on track that is contiguous to lower speed track may request FRA approval to operate at a higher level of cant deficiency using the same procedures available under § 213.329(c) and (d). The track owner or railroad must submit to FRA for approval a test plan which will determine through engineering analysis the safety limits for lateral carbody accelerations which can be used as a surrogate measure to determine the amount of wheel unloading under cant deficient operation.

Upon FRA approval of the test plan, the track owner or railroad may conduct incrementally increasing train speed test runs to demonstrate that wheel unloading is within the prescribed safety limits. Once the test is completed and FRA approves a level of cant deficient operation, paragraph (g) requires geometry car inspections and acceleration measurements to confirm the integrity of the vehicle/track interaction on the curves.

The provision in paragraph (g) does not apply to track owners or railroads which operate trains in only Classes 1 through 5. FRA must consider other factors associated with track in Classes 1 through 5, such as the likelihood of a decrease in overall track quality and an absence of information generated through vehicle qualification testing procedures as required under § 213.345. Therefore, a track owner or railroad wishing to operate in Classes 1 through

5 at cant deficiencies greater than four inches must petition FRA for a waiver.

Section 213.59—Elevation of Curved Track; Runoff

Proposed rule: The Track Working Group discussed this section and recommended that it remain as currently written.

Comments: FRA received no comments.

Final rule: FRA agrees with the recommendation of the Track Working Group and this section as proposed is adopted in this final rule.

§ 213.63—Track Surface

Proposed rule: The present track surface table contained in this section was established in the original standards more than 20 years ago and has served the industry well as a minimum safety requirement. However, some of the parameters need updating to recognize the knowledge gained from investigation of derailment causes, engineering analysis, and changes in terminology. Therefore, the NPRM proposed several changes to track surface requirements to better address current knowledge of track/vehicle interaction.

The NPRM proposed that the parameter referring to the rate of runoff at the end of a track raise and the parameter for deviation from uniform profile should both remain unchanged. The profile parameter is conservative for single occurrences on both rails and less conservative for repeated perturbations.

In the 1982 revisions to the Track Safety Standards, the requirement for maintenance of curve records, including degree of curvature and the amount of elevation designated in curves was removed. Since that time, the term ''designated elevation'' has been controversial and difficult to apply. The NPRM proposed to remove that term from the revised table.

The NPRM also proposed to revise the way the Track Safety Standards address transition spirals. For many curves, especially in the lower track classes, track maintenance personnel often differ as to the locations where spirals begin and end, as well as to the measured runoff rate. In view of the somewhat subjective nature of the concept of uniform runoff in spirals, the proposed changes in this notice use a different approach from runoff or ''variation in crosslevel in spirals'' and incorporate this parameter into another parameter.

In the present track surface table, the maximum variation in crosslevel in spirals could exceed that allowed on tangents and in the full body of curves over the same distance. The mechanism for derailment in the body of the curve is the same as in the spiral. The NPRM proposed that the differences in crosslevel in spirals be included in one parameter to simplify the table and correct the discrepancy that currently exists. The NPRM also proposed that the existing parameters referring to ''deviation from designated elevation'' and ''variation in crosslevel'' in spirals are unnecessary, provided spiral variations in crosslevel are included in the ''warp'' parameter. The ''warp'' parameter is measured by determining the difference in crosslevel between two points less than 62-feet apart.

While the difference in crosslevel parameter (warp) addresses the majority of situations where wheel climb or rock off can occur, three footnotes are added to the table to address specific situations.

The footnote identified by an asterisk inside the table addresses the present practice on some railroads to design a greater runoff of elevation in spirals due to physical restrictions on the length of spirals. Spiral runoff in new construction must be designed and maintained within the limits shown in the table for difference in crosslevel.

Footnote 1 is included to address the known derailment cause where a warp occurs in conjunction with an amount of curve elevation that approaches the maximum typically in use. When a vehicle is in an unbalanced condition on this curve elevation and encounters a warp condition, the vehicle is subjected to wheel/rail forces that could result in wheel climb.

Footnote 2 is included to address the harmonic rock off problem of which the railroad industry has been aware for many years. Under repeated warp conditions, the vehicle can experience an increase in side-to-side rocking that may result in wheel climb in curves or center plate separation on tangents.

Comments: Comments received supported the proposed amendments. One commenter questioned the use of the terms ''variation'' and ''difference,'' and recommended the consistent use of one or the other, but not both.

Final rule: The term ''variation'' only appears in the statement behind the asterisk inside the track surface table. The term ''variation'' is used because this statement refers to the previous warp standard for spirals which used the same term. In certain locations, the prior standard for warp in spirals will be grandfathered due to physical restrictions and therefore FRA believes the terms should be consistent. In all other instances in this section, the term ''difference'' is used exclusively. The final rule makes one change in the track surface table under the parameter described as the difference in crosslevel between any two points less than 62 feet apart, or commonly referred to as the ''warp'' parameter. The results of recent track twist (warp) studies conducted at the Transportation Technology Center (TTC), where three different vehicle types were tested to determine their responses to crosslevel and combined crosslevel/alinement perturbations on tangent and curved test zones, indicate that a limit for warp of 2¼ inches for Class 2 track would be more appropriate than the proposed limit of 2½ inches by RSAC. The report of the TTC testing was not available to the Track Working Group when their recommendations were made.

Section 213.101—Scope

Proposed rule: The Track Working Group discussed this section and recommended that it remain as currently written.

Comments: FRA received no comments.

Final rule: FRA agrees with the recommendation of the Track Working Group and this section as proposed is adopted in this final rule.

Section 213.103—Ballast; General

Proposed rule: The Track Working Group discussed this section and recommended that it remain as currently written.

Comments: FRA received no comments.

Final rule: FRA agrees with the recommendation of the Track Working Group and this section as proposed is adopted in this final rule.

Section 213.109—Crossties

Proposed rule: The NPRM proposed to amend this section to include several recommendations made by the Track Working Group and adopted by the RSAC. After reviewing FRA's Accident/Incident data base, the Track Working Group concluded that wide gage resulting from defective crossties continues to be the single largest causal factor associated with track-caused reportable derailments.

Gage widening forces applied to the track structure from the movement of rolling stock tend to increase as track curvature increases. Therefore, the NPRM proposed to increase the number of effective crossties required under subsection (c) for turnouts and curved track with over two degrees of curvature. The purpose of this proposed requirement was to strengthen the track structure to enable it to better resist such forces.

In Class 1 track, the required number of crossties in any 39-foot segment of track would increase from five to six; in Class 2 track, from eight to nine; in Class 3 track, from eight to 10; and in Classes 4 and 5 track, from 12 to 14. These changes were proposed to become effective two years after the effective date of the final rule.

Under subsection (d), the NPRM proposed an optional requirement for the number and placement of crossties near rail joints in Classes 3 through 5 track. The existing requirement calls for one crosstie within a specified distance from the rail joint location, while the proposed optional requirement would allow two crossties, one on each side of the joint, within a specified distance from the rail joint location. FRA previously examined both standards under various static loading conditions. The results indicated that the proposed optional requirement provides equal or better joint support than the present requirement.

The NPRM also proposed to add a new subsection (e) to address track constructed without conventional crossties, such as concrete-slab track. The existing standards do not address this type of construction in which the running rails are secured through fixation to another structural member. The proposed addition addressed this type of track construction by requiring railroads to maintain gage, surface, and alinement to the standards specified in subsections (b)(1)(i), (ii), and (iii).

Comments: Comments received supported the proposed amendments. One commenter suggested that the GRMS technology be incorporated into this section.

Final rule: As discussed earlier in the preamble to this final rule, a separate task group continues to evaluate GRMS technology for possible incorporation into the Track Safety Standards.

The final rule includes subsection (c) as it is currently written, as well as subsection (d) to become effective two years after the effective date of this final rule.

The section as proposed is adopted in this final rule with renumbering of the subsections. Subsection (d) in the NPRM appears as subsection (f) in the final rule, and subsection (e) in the NPRM appears as subsection (g) in the final rule.

Section 213.113—Defective Rails

Proposed rule: The NPRM proposed several substantive changes to this section which reflect the results of FRA's on-going rail integrity research program. The results indicate the need to revise the remedial action tables and specifications to more adequately address the risks of rail failure, reserving the most restrictive actions on limiting operating speed for those rail defects which are large enough to present a risk of service failure.

Because ''zero percent'' entries serve no useful purpose, they should be dropped from the remedial action tables. Similarly, ''100 percent'' of rail head cross-sectional area is not a meaningful dividing point for transverse defects. The proposed revisions to the remedial action table for transverse defects placed a lower limit of five percent of the rail head cross-sectional area. If a transverse defect is reported to be less than five percent, no remedial action would be required under the revised standards. Defects reported less than five percent are not consistently found during rail breaking programs and therefore defect determination within this size range is not always reliable. Furthermore, if the determination is reliable, defect growth to service failure size within the newly established testing frequency under § 213.237 is highly unlikely. The proposed revisions to the remedial action table for transverse defects also established one or more mid-range defect sizes, between five percent and 100 percent, each of which would require specific remedial actions.

In the proposed revised remedial action table, all longitudinal defects were combined within one group subject to identical remedial actions based on their reported size. These types of longitudinal defects all share similar growth rates and the same remedial actions are appropriate to each type. The lower limit of ''0'' inches was eliminated and the size divisions were revised upward slightly to reflect FRA's research findings which indicate that this class of rail defect has a relatively slow growth rate.

The ''0'' inch lower limit was eliminated also for bolt hole cracks and broken bases. The proposed revision also included minor changes in the size divisions for bolt hole cracks, as well as changes in the required remedial action for broken bases less than 6 inches and damaged rail.

The NPRM also proposed to add ''Flattened Rail'' to the rail defect table. Although it is not a condition shown to affect the structural integrity of the rail section, it can result in less-than-desirable dynamic vehicle responses in the higher speed ranges. The flattened rail condition is identified in the table, as well as in the definition portion of subsection (b), as being ⅜ inches or more in depth and 8 inches or more in length.

The Track Working Group discussed at length a ''break out in rail head,'' but was unable to agree on a standard definition. The RSAC therefore recommended that the industry continue to be guided by FRA's current interpretation that a break out in the rail head consists of a piece physically separated from the parent rail.

The NPRM also proposed to make several substantive revisions to the remedial actions specified under ''Notes'' in subsection (a)(2) of this section. A new note ''A2'' was added to address the mid-range transverse defect sizes which were added to the table. This remedial action allows for train operations to continue at a maximum of 10 m.p.h. for up to 24 hours, following a visual inspection by a person designated under § 213.7.

Note ''B'', which currently does not define a limiting speed, was changed to limit speed to 30 m.p.h. or the maximum allowable speed under § 213.9 for the class of track concerned, whichever is lower.

Notes ''C'', ''D'', and ''H'' were revised to limit the operating speed, following the application of joint bars, to 50 m.p.h. or the maximum allowable speed under § 213.9 for the class of track concerned, whichever is lower. Presently, the standards limit speed to 60 m.p.h. or the maximum allowable speed under § 213.9 for the class of track concerned, whichever is lower.

A second paragraph in Note ''C,'' the remedial action which applies specifically to detail fractures, engine burn fractures, and defective welds, proposed a significant change to the current standards. This revision addressed defects which are discovered in Classes 3 through 5 track during an internal rail inspection required under § 213.237, and whose size is determined not to be in excess of 25 percent of the rail head cross-sectional area. For these specific defects, a track owner may operate for up to four days at a speed limited to 50 m.p.h. or the maximum allowable speed under § 213.9 for the class of track concerned, whichever is lower. If the defective rail is not removed or a permanent repair made within four days of discovery, the speed is limited to 30 m.p.h. until joint bars are applied.

Under the existing standards, these types of defects, predominant on heavy utilization trackage, would require a 30 m.p.h. restriction until joint bars are applied. Practice within the industry today is to operate the rail test vehicle until the number of defects found exceeds the railroad's ability to effect immediate repairs. At that time the rail test vehicle is shut down for the day.

The purpose of this practice is to reduce speed restrictions which not only affect the railroad's ability to move trains, but also can produce undesirable in-train forces that can lead to derailments. However, prematurely shutting down rail test car operations negate any possibility of discovering larger and more serious defects that may lie just ahead.

Furthermore, the results of FRA's research indicate that defects of this type and size range have a predictable slow growth life. Research indicates that even on the most heavily utilized trackage in use today, defects of this type and size are unlikely to grow to service failure size in four days.

Comments: Comments received generally supported the proposed amendments to this section. One commenter suggested that definitions for ''bolt hole crack,'' ''defective weld,'' and ''head-web separation'' should be added to subsection (b). This commenter also suggested that remedial actions for certain rail defects, which are expressed in terms of an ''either/or'' option, could be made less ambiguous by bracketing those options.

One commenter suggested that a periodic re-examination of ''flattened rails'' should be required so that the severity and growth rate of this rail defect can be monitored. This commenter also suggested that ''shelled rail'' should be defined as a rail defect which would require some specified remedial action.

One commenter argued that when a track owner voluntarily elects to conduct a continuous search for internal defects on Class 1 and 2 track where regulatory requirements for inspections of this type are non-existent, any rail defects found should be subject to the requirements of only remedial action B, regardless of the defect type or size of the defect. The commenter argued that such a provision would ensure that there is not a regulatory disincentive for voluntarily conducting internal rail inspections on Class 1 and 2 track.

Another commenter suggested that FRA's definition of ''break out in rail head'' should be more restrictive than the present version. This commenter also suggested that the final rule should set parameters for determining ''excessive rail wear'' in a manner similar to the methods used to measure excessive wheel wear prescribed in the 49 CFR Part 215, Railroad Freight Car Safety Standards.

Final rule: The Track Working Group discussed at length the issues associated with ''flattened rail'' (localized collapsed head rail) and ''shelled rail.'' FRA and industry research indicates that these occurrences are more accurately categorized as rail surface conditions, not rail defects, as they do not in themselves cause service failure of the rail.

FRA believes that the risk of detail fractures being masked by ''shelled rail'' conditions was appropriately addressed in the proposed rule by specifying more restrictive inspection intervals and by requiring specific remedial actions to be taken when surface conditions such as ''shelled rail'' prevent a valid inspection for internal defects. The proposed rule addresses the issue of ''flattened rail'' in terms of a specified remedial action for those of a certain depth and length. FRA believes that further monitoring of ''flattened rail'' conditions can be accomplished without prescribing regulations which mandate inspection procedures beyond which already exist. FRA's rail integrity research program will continue to study ''shelled rail'' and ''flattened rail'' conditions, and in the event that research indicates additional regulation is necessary in the future, FRA will not hesitate to do so.

The Track Working Group was unable to improve FRA's current definition of a ''break out in rail head.'' The current definition, when viewed in terms of the remedial action which it requires when met, has been considered too liberal under certain circumstances, while conversely, it has also been considered too conservative under other circumstances. The circumstances primarily dictated by the type and size of defect, along with the location of the defect in the rail. FRA believes that under the current remedial action requirement, the current definition for ''break out in rail head'' is adequate.

The issue of ''excessive rail wear'' continues to be evaluated by FRA's rail integrity research program. FRA believes that insufficient data exist at this time which would indicate that parameters for this condition should be proposed as a minimum safety standard.

FRA believes that the remedial action tables and specifications in this final rule better address the risks associated with rail failure. These risks are primarily dependent upon defect type and size and should not be dependent upon the manner or mechanism which reveals the existence of the defect. FRA believes that providing special regulatory relief for defects found during voluntary inspections for internal rail defects would not be a prudent approach to take. However, in revising the remedial action table, FRA has sought to provide enhanced flexibility where warranted by safety considerations.

FRA agrees that additional definitions would be helpful, so this final rule adds definitions for ''bolt hole crack,'' ''defective weld,'' and ''head-web separation.'' FRA also agrees that bracketing certain ''either/or'' remedial actions will clarify the intent of those requirements.

With the exception of these minor changes, the rule is adopted as proposed by the Track Working Group and endorsed by the RSAC.

Section 213.115—Rail End Mismatch

Proposed rule: The Track Working Group discussed this section and recommended that it remain as currently written.

Comments: FRA received no comments.

Final rule: FRA agrees with the recommendation of the Track Working Group and this section as proposed is adopted in this final rule.

Section 213.119—Continuous Welded Rail (CWR); General

Proposed rule: The NPRM proposed to introduce a requirement for railroads to establish and place in effect written procedures to address CWR. These procedures must address the installation, adjustment, maintenance and inspection of CWR track, and include a formal training program for the application of these procedures. The procedures, including a program for training, must be submitted to FRA within six months following the effective date of this rule. Although many railroads already have in effect a CWR program, FRA will review each submitted set of procedures for compliance with the individual requirements of the proposed regulation.

Within the last decade, through the determined efforts of researchers from industry and government, along with experience gained from accident investigators and track maintenance people, the railroad industry has gained a better comprehension of the mechanics of laterally unstable CWR track. As a result, the industry has identified maintenance procedures that are critical to maintaining CWR track stability.

As proposed, the requirements do not detail how each procedure is to be carried out. Rather, they identify the basic safety issues and permit railroads to develop and implement their own procedures to address those issues, provided the procedures are consistent with current research results as well as findings from practical experience documented in recent years. The procedures should be clear, concise, and

easy to understand by maintenance-of-way employees. A comprehensive training program must be in place for the application of these procedures.

The proposed regulation requires the designation of a ''desired rail installation temperature range'' for the geographic area in which the CWR is located. By definition contained in the proposed regulation, ''desired rail installation temperature range'' is the rail temperature range at which forces in CWR should not cause a track buckle in extreme heat, or a pull-apart during cold weather. Current general practice within the industry, based to a large extent on research findings, is to establish a ''desired rail installation temperature range'' which is considerably higher than the annual mean temperature for the geographic area in which the CWR is located. The regulation, as proposed in the NPRM, provides railroads with flexibility to establish the ''desired rail installation temperature range'' based on the characteristics of the specific territory involved and the historical knowledge acquired through the application of past procedures.

When CWR is installed and anchored/fastened at the ''desired rail installation temperature range,'' it is considered to be in its initial ''stress-free'' state, where the net longitudinal force is equal to zero. Research discloses that many factors, some of which are unavoidable, like dynamics of train operation, the necessary lining and surfacing of the track structure, and performing rail repairs all contribute to a gradual lowering over time of the initial rail installation temperature range which increases the potential for track buckling. This phenomenon substantiates the need to install and anchor/fasten CWR at a relatively high rail installation temperature range.

Maintenance of the ''desired rail installation temperature range'' is critical to ensuring CWR stability. Therefore, the procedures for installation, adjustment, effecting rail repairs, and repairing track buckles or pull-aparts must compare the existing rail temperature with the ''desired rail installation temperature range'' for the area concerned.

The procedures also must address several other topics, such as rail anchoring, controlling train speed when CWR track has been disturbed, ballast re-consolidation, inspections, and recordkeeping for the installation of CWR and rail repairs that do not conform to the railroad written procedures. A track owner may update or modify CWR procedures as necessary, upon notification to FRA of those changes.

Development of individual CWR programs could prove burdensome for many small railroads. As recommended by the Track Working Group, FRA will work with the ASLRA to develop a generic set of CWR procedures to apply to low speed/low tonnage Class 2 and Class 3 railroad operations.

Comments: Comments generally supported the proposed amendment. One commenter questioned the need for certain railroads that only conduct low speed/low tonnage operations to adopt written procedures addressing CWR. Another commenter questioned FRA's enforceability of the proposed new section.

Final rule: The details of these procedures are to be based on research findings and sound engineering principles. FRA is committed to working with ASLRA to develop a generic set of CWR procedures with wide applicability for the spectrum of smaller railroads. FRA believes that certain requirements contained in the generic procedures, such as a requirement to operate at reduced speed following maintenance work which disturbs the track, will not have an impact on a railroad that normally only operates at 10 m.p.h. Other requirements of this generic set of procedures would also be less burdensome due to the nature of most low speed/low tonnage operations.

This new section is enforceable to the extent that CWR procedures must be developed and implemented, and employees responsible for their application must be trained on these procedures. In the proper exercise of its enforcement discretion, the agency is unlikely to take enforcement action against minor deviations from CWR procedures unless, together with other violations, they are part of a larger problem.

Section 213.121—Rail Joints

Proposed rule: Under existing subsection (a), the phrase ''proper design and dimension'' often has been interpreted to prohibit the use of any joint bar on a rail section for which it was not specifically designed. This interpretation does not consider the fact that certain joint bars are interchangeable between different rail sections. Therefore, the NPRM proposed to change the word ''proper'' to ''structurally sound'' in subsection (a).

In subsection (b), the NPRM proposed to add the modifier ''excessive'' in front of the phrase ''vertical movement.'' The existing language in this subsection implies that no vertical movement of either rail could be allowed when all bolts are tight. This interpretation is too strict. FRA's Enforcement Manual suggests that FRA inspectors evaluate excessive vertical movement when determining compliance with this paragraph. This change would make the rule conform to sound practices.

The NPRM proposed to extend to Class 2 track the prohibition of torch cutting bolt holes in rail. The reference to joint bars was removed, the subject to be covered in the proposed new subsection (h) which restricts the practice of re-configuring joint bars. Joint bars for older rail sections are becoming increasingly difficult to find and are no longer being manufactured. Therefore, the new subsection (h) prohibits the re-configuration of joint bars in Classes 3 through 5 track, but not in Classes 1 and 2 track.

Comments: Comments generally supported the proposed amendments. One commenter agreed that the term ''structurally sound'' is more technically correct, but stated that the term provides no additional guidance as to what joint bars are interchangeable with various rail sections. Several commenters suggested that the prohibition on reconfiguring joint bars with a torch should be extended to Class 2 track. Another commenter suggested that the term ''excessive'' should be quantified.

Final rule: FRA believes the risks in the lower speed track classes are minimal when a railroad torch cuts bolt holes in joint bars and reconfigures joint bars with a torch. The most critical of joint bar failures are those in which the bar cracks or breaks through the middle two bolt holes. If this were to happen as a result of reconfiguring by a torch, a regulation already exists which prohibits any cracks or breaks in this area of the joint bar for any class of track.

FRA believes that the term ''excessive'' in the context of this section should be left to the discretion of a qualified person based on that person's evaluation of what risks may be associated with any particular set of conditions. FRA agrees that additional guidance should be provided for the interpretation of ''structurally sound'' joint bars and will work with the industry to develop and issue guidelines in the form of a Technical Bulletin addressing the interchange ability of joint bars between various rail sections. This approach is similar to a recent recommendation issued by FRA's Technical Resolution Committee.

The rule is adopted as proposed by the NPRM.

Section 213.122—Torch Cut Rail

Proposed rule: The NPRM proposed this new section to address the proper

handling of rails cut by the use of a torch. The practice of torch-cutting rail at one time was commonplace on railroads, but was discontinued in higher speed track several years ago when better saws were developed and railroads discovered that rails that have been torch-cut have a greater tendency to develop fractures. Today, on track Classes 3 and above, the practice is used almost exclusively for temporary emergency repairs, such as quickly returning a track to service following a derailment or washout. These locations are then quickly replaced with new rail. The purpose of this section is to outlaw the practice of torch cutting rails, except for emergency repairs, on all track in classes above Class 2. Train speed on track that has been torch cut for emergency repairs made after the effective date of this rule must be reduced to the maximum allowable speed for Class 2 until the torch cut rail is replaced.

The proposed section also provides railroads with guidance for eliminating old torch cut rail in track Classes 3 through 5. The industry believes no torch cuts exist in Class 6 track. Torch cuts in Class 5 track must be eliminated within a year of the effective date of this final rule, while torch cuts in Class 4 track must be removed within two years. Within one year of the effective date of this final rule, railroads must inventory existing torch cuts in any Class 3 track over which regularly scheduled passenger trains operate. Those torch cuts found and inventoried will be ''grandfathered in.'' Any torch cuts that are found on such track after the expiration of one year and that are not inventoried will be limited immediately to Class 2 speed and removed within 30 days of discovery. If a railroad chooses to upgrade a segment of track from Classes 1 or 2 to Class 3, and regularly scheduled passenger trains operate over that track, the railroad must remove any torch cuts before the speeds can be increased beyond the maximum allowable for Class 2 track. If a railroad chooses to upgrade a segment of track from any class of track to Class 4 or 5, it must remove all torch cuts.

Comments: Comments received generally supported the proposed amendments. Several commenters suggested that torch cut rail ends be prohibited in all but Class 1 track. One commenter also suggested that existing torch cut rail ends be restricted to 10 m.p.h..

Final rule: FRA believes the risks associated with torch cut rail ends in Class 2 track are minimal based on lower speeds and lower impact loads. If rail defects were to develop as a result of torch cut rail ends, requirements already exist which would address them. FRA also believes that existing torch cut rail ends have survived the early mortality rate which is associated with rails that fail due to poor torch cutting practices, and therefore existing torch cuts do not present a significant risk, given the low frequency of expected failure and lower accident severity at Class 2 speeds.

The rule is adopted as proposed by the NPRM.

Section 213.123—Tie Plates

Proposed rule: The NPRM proposed to add a new subsection (b) to this section which reads, ''In Classes 3 through 5 track, no metal object which causes a concentrated load by solely supporting a rail shall be allowed between the base of rail and the bearing surface of the tie plate.'' The specific reference to ''metal object'' is intended to include only those items of track material which pose the greatest potential for broken base rails such as track spikes, rail anchors, and shoulders of tie plates. The phrase ''causes a concentrated load by solely supporting a rail'' further clarifies the intent of the regulation to apply only in those instances where there is clear physical evidence that the metal object is placing substantial load on the rail base, as indicated by lack of load on adjacent ties.

Comments: Comments supported the proposed amendment.

Final rule: The rule is adopted as proposed by the NPRM.

Section 213.127—Rail Fastening Systems

Proposed rule: The NPRM proposed to change the title of this section from ''Rail fastenings'' to ''Rail fastening systems'' and to reduce the language of the regulation to one sentence which reads, ''Track shall be fastened by a system of components which effectively maintains gage within the limits prescribed in § 213.53(b).''

The change to ''rail fastening systems'' more adequately addresses the many individual components of modern-day elastic fastening systems, such as pads, insulator clips, and shoulder inserts. The failure of certain critical components within the system could adversely affect the ability of the individual fastener to provide adequate gage restraint. The revised language of the regulation provides for an evaluation of all components within the system, if necessary, in order to evaluate whether they are affording effective gage restraint.

The RSAC considered the current reference to qualified Federal or State track inspectors and the definition of a qualified State track inspector to be redundant, given the adoption of Part 212. Therefore, the NPRM proposed to delete the phrase ''qualified Federal or State track inspector,'' as well as the last sentence of the current section which contains the definition of a qualified state track inspector.

Comments: Comments supported the proposed amendment. One commenter suggested that the GRMS technology be incorporated into this section.

Final rule: As discussed earlier in the preamble to this final rule, a separate task group continues to evaluate GRMS technology for possible incorporation into the Track Safety Standards. The rule is adopted as proposed by the NPRM.

Section 213.133—Turnouts and Track Crossings Generally

Proposed rule: The NPRM proposed to retain the language of subsection (a) which reads, ''In turnouts and track crossings, the fastenings must be intact and maintained so as to keep the components securely in place.'' The AAR proposed to revise the language to say, ''* * * the fastenings must be maintained for the safe passage of trains.'' The AAR contended that turnout and track crossings are designed with a high degree of redundancy, making it unnecessary for each fastening to be intact to maintain safety. However, the RSAC recommended that the regulations allow track inspectors discretion to evaluate immediate circumstances in determining what level of remedial action is necessary for loose or missing fastenings. RSAC recommended that inspectors be provided specific guidance about interpreting this provision, such as the guidance contained in technical bulletin T–95–09 recently issued by FRA.

The NPRM proposed to change subsection (b) to reflect proposals presented by the BMWE and by the AAR and FRA. The RSAC recommended that rail anchoring requirements be extended to include Class 3 trackage and that ''rail anchors'' be changed to ''rail anchoring '' so that rail anchoring would include elastic rail fasteners.

Comments: Comments supported the proposed amendments.

Final rule: The rule is adopted as proposed by the NPRM.

Section 213.135—Switches

Proposed rule: The NPRM proposed to revise subsection (b) to consider the existence of reinforcing bars or straps on

switch points where joint bars cannot be applied to certain rail defects, as required under § 213.113(a)(2), because of the physical configuration of the switch. In these instances, remedial action B will govern, and a person designated under § 213.7(a), who has at least one year of supervisory experience in track maintenance, will limit train speed to that not exceeding 30 m.p.h. or the maximum allowable under § 213.9(a) for the appropriate class of track, whichever is lower. Of course, the person may exercise the options under § 213.5(a) when appropriate.

The RSAC did not recommend specific dimensions for determining when switch points are ''unusually chipped or worn,'' as provided for in subsection (h). FRA stated that its Accident/Incident data base indicates that worn or broken switch points are the largest single cause of derailments within the general category of ''Frogs, Switches, and Appliances.'' However, the AAR contended that developing meaningful numbers for these measurements would be a difficult task because most of these derailments are related also to other causal factors such as wheel flange condition, truck stiffness, and train handling characteristics. The NPRM, therefore, proposed to retain the current wording in subsection (h), allowing qualified individuals to evaluate immediate circumstances to determine when switch points are ''unusually chipped or worn.''

The NPRM also proposed a new subsection (i) to read, ''Tongue and plain mate switches, which by design exceed Class 1 and excepted track maximum gage limits, are permitted in Class 1 and excepted track.'' This new subsection provides an exemption for this item of specialized track work, primarily used in pavement or street railroads, which by design does not conform to the maximum gage limits prescribed for Class 1 and excepted track.

Comments: Comments generally supported the proposed amendments. One commenter suggested that the term ''unusually chipped or worn'' be quantified.

Final rule: FRA believes that the term ''unusually chipped or worn'' in the context of this section should be left to the discretion of a qualified person based on that person's evaluation of what risks may be associated with any particular set of circumstances. The rule is adopted as proposed by the NPRM.

Section 213.137—Frogs

Proposed rule: The NPRM proposed to add a new subsection (d) to this section, which reads, ''Where frogs are designed as flange-bearing, flangeway depth may be less than that shown for Class 1 if operated at Class 1 speeds.'' This subsection provides an exemption for an item of specialized track work which by design does not conform to the minimum flangeway depth requirements prescribed in subsection (a) of this section.

Comments: Comments received supported the proposed amendment.

Final rule: The rule is adopted as proposed by the NPRM.

Section 213.139—Spring Rail Frogs

Proposed rule: The proposed rule recommended no changes to this section.

Comments: No comments were received.

Final rule: This final rule inserts the word ''compression'' for that of the phrase ''a tension'' in subsection (d) to correct a technical error in wording. In order for the wing rail to be held tight against the point rail, the spring must be in compression and not in tension.

Except for this minor change, the rule is adopted as proposed by the NPRM.

Section 213.141—Self-Guarded Frogs

Proposed rule: The Track Working Group discussed this section and recommended that it remain as currently written.

Comments: FRA received no comments.

Final rule: FRA agrees with the recommendation of the Track Working Group and this section as proposed is adopted in this final rule.

Section 213.143—Frog Guard Rails and Guard Faces; Gage

Proposed rule: To facilitate an easier understanding of the requirements contained in this section, the NPRM proposed to add a diagram to illustrate the method for measuring guard check gage and guard face gage. The proposal contained no substantive changes to this section.

Comments: Comments supported the proposed amendment.

Final rule: The rule is adopted as proposed by the NPRM.

Section 213.201—Scope

Proposed rule: The Track Working Group discussed this section and recommended that it remain as currently written.

Comments: FRA received no comments.

Final rule: FRA agrees with the recommendation of the Track Working Group and this section as proposed is adopted in this final rule.

Section 213.205—Derails

Proposed rule: The NPRM proposed to add language to this section designed to ensure that derails are maintained to function properly. The RSAC recommended these changes as additional safety features for train crews, as well as railroad employees working on and around tracks.

Comments: Comments supported the proposed amendments.

Final rule: The rule is adopted as proposed by the NPRM.

Section 213.231—Scope

Proposed rule: The Track Working Group discussed this section and recommended that it remain as currently written.

Comments: FRA received no comments.

Final rule: FRA agrees with the recommendation of the Track Working Group and this section as proposed is adopted in this final rule.

Section 213.233—Track Inspections

Proposed rule: The NPRM proposed several changes to subsection (b). The five m.p.h. restriction over highway crossings is eliminated to permit safe operation of vehicles through highway traffic. However, the subsection would still require an inspector to perform an adequate inspection, regardless of how the inspector operates over the crossing. Also, the word ''switch'' is replaced by the word ''turnout'' to clarify the track device originally intended to be addressed in the regulation.

The Track Working Group considered advising the RSAC to recommend specific speed restrictions for inspection vehicles. However, after several lengthy discussions, the group suggested instead that this subsection provide the individual inspector with sole discretion in determining vehicle speed based on track conditions, inspection requirements, and other circumstances that may vary from day to day and location to location. The group also suggested the insertion of a footnote at the end of this section which indicates this discretion is not limited by any other part of this section, and is extended to determine sight distance (''visibility remains unobstructed by any cause'') which is referenced in paragraphs (b)(1) and (2) of this section.

The existing language under subsection (b) does not specify how many tracks may be inspected in one pass of an inspection vehicle in multiple track territory. FRA has never issued interpretive language regarding this issue, opting to judge the overall effectiveness of the inspection program

rather than the specific manner in which it was conducted. The NPRM proposed to establish some guidelines for hyrail inspections conducted in multiple track territory.

As a result, subsection (b), as proposed in the NPRM, contains additional language specifying the number of additional tracks that can be inspected, depending on whether one or two qualified individuals are in the vehicle, and depending on the distance between adjacent tracks measured between track centerlines. Inspectors may inspect multiple tracks from hy-rail vehicles only if their view of the tracks inspected is unobstructed by tunnels, differences in ground level, or any other circumstance that would prevent an unobstructed inspection of all the tracks they are inspecting. The revised subsection also requires railroad to traverse each main track bi-weekly and each siding monthly, and to so note on the appropriate track inspection records.

With respect to the inspection frequency required in subsection (c), neither the Track Working Group nor the RSAC could reach agreement in determining a frequency requirement that would be based on speed, tonnage, or track usage. Therefore, the NPRM did not propose to change the language in this subsection.

Comments: Comments generally supported the proposed amendments. Several commenters suggested that the requirements that address inspections in multiple track territory should be more restrictive. Several commenters suggested that a maximum speed limit should be set when performing inspections for compliance with this part, one of which suggested a maximum speed of 15 m.p.h..

Final rule: FRA believes that the appropriate vehicle inspection speed over a particular territory is subject to many variables, *i.e.*, track condition, type of track construction, weather conditions, time of day, as well as many others which may only be apparent to the individual inspector at that moment in time. With this in mind, FRA believes that the appropriate vehicle speed for any particular set of conditions should be determined by the person performing the inspection, including those performed in multiple track territory. The final rule provides for the inspector's discretion as it involves inspection speed and sight distance.

This final rule also changes this section by cross-referencing excepted track in the § 213.233(c) table for required inspection frequency.

Section 213.235—Inspection of Switches, Track Crossings, and Lift Rail Assemblies or Other Transition Devices on Moveable Bridges

Proposed rule: The NPRM proposed to change subsection (a) by adding the word ''turnout'' after the word ''switch'' to clarify the track device and the intent of the requirement which is to inspect the entire turnout. The word ''switch'' is retained to include switch point derails or any other device which is not considered a full turnout.

The NPRM proposed a second sentence to be added to subsection (a) which reads, ''Each switch in Classes 3 through 5 track that is held in position only by the operating mechanism and one connecting rod shall be operated to all of its positions during one inspection in every three-month period.'' The nature of this type of switch requires a thorough inspection of the critical parts, some of which are non-redundant. Thorough inspection is best accomplished by operating the switch mechanism to allow for a better inspection of these components. The phrase ''all positions'' is intended to cover slip switches and lap switches.

In subsection (b), the word ''turnout'' is added after the word ''switch'' for the same reasons explained above.

Comments: Comments generally supported the proposed amendments. One commenter suggested that all switch mechanisms should be operated during inspections required under this section.

Final rule: FRA believes that a requirement to operate all switch mechanisms on a monthly basis would be too burdensome on the industry, especially in some geographical locations that are subject to snow, ice, and freezing conditions for many months of the year.

The final rule includes several changes to this section. On November 23, 1996, more than three weeks after the Track Working Group had submitted its recommendations for revision of the Track Safety Standards to the RSAC, an Amtrak passenger train derailed on the moveable bridge over the Hackensack River in Secaucus, New Jersey. This derailment was the result of a malfunctioning lift rail assembly which provides the transition from the moveable span to the fixed span on the bridge. Because of this derailment, FRA believes that transition devices on moveable bridges should be addressed in the revised Track Safety Standards.

Therefore, this final rule adds moveable bridge lift rail assemblies and other transition devices to the inspection requirements in this section. This section adds only a requirement to visually inspect on foot; it is not intended to impose additional functional requirements for bridge lift rail assemblies beyond what is already required by the Track Safety Standards. However, FRA considers these assemblies to be no less critical than switches or track crossings, and they should be subject to monthly on-foot visual inspections by a person qualified under § 213.7.

In addition, this section is restructured in order to reference the operation of specified switch operating mechanisms in a separate subsection (b). This change is designed to emphasize the importance of these non-redundant mechanisms.

Section 213.237—Inspection of Rail

Proposed rule: Under existing subsection (a), the Track Safety Standards require Classes 4 and 5 track, as well as Class 3 track over which passenger trains operate, to be tested annually for internal rail defects. This requirement was established at a time when main line freight traffic was considerably lighter than it is today. At the time the original standards were drafted, test frequencies generally equated to intervals between 15 and 20 million gross tons (MGTs), although there existed some track that carried 40 MGTs or more in one year. As a matter of practice, railroads generally test more often than presently required under the standards, with intervals between tests typically ranging from 20 to 30 MGTs. These typical intervals define a good baseline for generally accepted maintenance practices, and the industry's rail quality managers consider these limits as points of departure for adjustment of test schedules to account for the effects of specific track characteristics, maintenance, traffic, and weather.

The NPRM proposed to leave unchanged the present annual test requirement for Classes 4 and 5 track and Class 3 track over which passenger trains operate, based on risk factors associated with freight train speeds and passenger train operations. However, with the high utilization trackage that now exists on Class 1 freight railroads, the original requirement based solely on the passage of time, without regard to tonnage, is no longer adequate.

Selecting an appropriate frequency of rail testing is a complex and somewhat controversial task involving many different factors including temperature differential, curvature, residual stresses, rail sections, and cumulative tonnage. Taking into consideration all of the above factors, FRA's research suggests

that 40 MGTs is the maximum tonnage that can be hauled between rail tests and still allow a safe window of opportunity for detection of an internal rail flaw before it propagates in size to service failure. The NPRM proposed that intervals be set at once per year or 40 MGTs, whichever is shorter, for Classes 4 and 5 track and for Class 3 track over which passenger trains operate.

The NPRM also proposed that Class 3 trackage not supporting passenger traffic be subject to testing for internal rail defects. FRA's Accident/Incident data point to a need for inclusion of all Class 3 trackage in a railroad's rail testing program. Therefore, the NPRM proposed to add a requirement that Class 3 track over which passenger trains do not operate be tested once a year or once very 30 MGTs, whichever is longer.

The NPRM proposed the limit of once a year or 30 MGTs because a more frequent testing cycle or a cycle identical to that proposed for Classes 4 and 5 track would be too burdensome for the industry. The proposed limits are designed to give short line railroads and low tonnage branch lines some relief from the introduction of a new regulatory requirement and still reduce the present risks associated with not testing Class 3 track at all.

The NPRM also proposed the addition of subsections (d) and (e). Subsection (d) addresses the case where a valid search for internal rail defects could not be made because of rail surface conditions. Several types of technologies are presently employed to continuously search for internal rail defects, some with varying means of displaying and monitoring search signals. A continuous search is intended to mean an uninterrupted search by whatever technology is being used, so that there are no segments of rail which are not tested. If the test is interrupted, *i.e.*, as a result of rail surface conditions which inhibit the transmission or return of the signal, then the test over that segment of rail may not be valid because it was not continuous. Therefore, as proposed in the NPRM, a non-test is not defined in absolute technical terms. Rather, the provision leaves this judgment to the rail test equipment operator who is uniquely qualified on that equipment.

As proposed in the NPRM, subsection (e) specifies the options available to a railroad following a non-test due to rail surface conditions. These options must be exercised prior to the expiration of time or tonnage limits specified in paragraph (a) of this section.

Comments: Comments supported the proposed amendments.

Final rule: The rule is adopted as proposed by the NPRM.

Section 213.239—Special Inspections

Proposed rule: The RSAC recommended no change to this section, and likewise, the NPRM proposed no change to the language in the regulation. However, the preamble of the NPRM provided an explanation of agency policy interpreting the section.

Comments: One commenter referred to the Notice of Safety Advisory 97–1, issued by FRA on September 4, 1997. *See* 62 FR 46793. The commenter recommended that the provisions contained in the advisory be adopted as regulations under this section.

Because of a number of fairly recent train derailments caused by unexpected track damage from moving water, FRA deemed it appropriate to issue the safety advisory to provide railroads with recommended procedures that reflect best industry practice for special track inspections. The procedures include: (1) prompt notification of dispatchers of expected bad weather; (2) limits on train speed on all track subject to flood damage, following the issuance of a flash flood warning, until special inspection can be performed; (3) identification of bridges carrying Class 4 or higher track which are vulnerable to flooding and over which passenger trains operate; (4) availability of information about each bridge, such as identifying marks, for those who may be called to perform a special inspection; (5) training programs and refresher training for those who perform special inspections; and (6) availability of a bridge maintenance or engineering employee to assist the track inspectors in interpreting the inspectors' findings.

Final rule: The rule is adopted as proposed by the NPRM, and does not incorporate the procedures outlined in the Notice of Safety Advisory 97–1. As it stated in that advisory, FRA believes that this section is necessarily general in nature, because it is not practical to specify in a minimum safety standard all the conditions which could trigger a special inspection, nor the manner in which any particular special inspection should be conducted. Of course, all such inspections should be conducted so as to effectively prevent derailments, and the procedures included in the safety advisory are designed to aid railroads in performing effective inspections.

Although this section contains a sample list of surprise events that routinely occur in nature, FRA does not view this provision as limited to only the occurrences listed or to only natural disasters. The section addresses the need to inspect after ''other occurrences'' which include such natural phenomena as temperature extremes, as well as unexpected events that are human-made, *e.g.*, a vehicle that falls on the tracks from an overhead bridge, a water main break that floods a track roadbed, or terrorist activity that damages track. This interpretation is not new; FRA has always viewed this section to encompass sudden events of all kinds that affect the safety and integrity of track.

Section 213.241—Inspection Records

Proposed rule: The NPRM proposed to change the requirement that railroads retain a record of each track inspection at division headquarters for at least one year. When this provision in subsection (b) was first written, railroads maintained many division headquarters throughout their systems, making it relatively convenient for railroads to maintain inspection records at these locations. Over the years, however, railroads consolidated many of their headquarters, often naming only a few locations as ''division headquarters.'' FRA has contended that maintaining inspection records in only a few locations over a system that may include thousands of miles of track was not in keeping with the spirit of the regulation. Railroads have argued, on the other hand, that compelling them to maintain headquarters for no other purpose than to store records was a burdensome requirement.

The NPRM proposed to allow railroads to designate a location within 100 miles of each state where records can be viewed by FRA track inspectors following 10 days notice by FRA. The provision does not require the railroads to maintain the records at these designated locations, only to be able to provide viewing of them at the locations within 10 days after notification. The proposal stipulates locations within 100 miles of each state, rather than locations in each state, to accommodate those railroads whose operations may cross a state's line by only a few miles. In those cases, the railroad could designate a location in a neighboring state, provided the location is within 100 miles of that state's border.

A change to subsection (c) requires a track owner to record any locations where a proper rail inspection cannot be performed because of rail surface conditions. A new provision at § 213.237(d) specifies that if rail surface conditions prohibit the railroad from conducting a proper search for rail defects, a test of that rail does not fulfill the requirements of § 213.237(a) which requires a search for internal defects at

specific intervals. The new language in subsection (c) of this section requires a recordkeeping of those instances.

The NPRM also proposed to add a provision for maintaining and retrieving electronic records of track inspections. Patterned after an experimental program successfully tried by the former Atchison Topeka & Santa Fe Railroad with oversight by FRA, the provision in subsection (e) allows each railroad to design its own electronic system as long as the system meets the specified criteria to safeguard the integrity and authenticity of each record. The provision also requires that railroads make available paper copies of electronic records when needed by FRA or by railroad track inspectors.

Comments: Comments supported the proposed amendments.

Final rule: The rule is adopted as proposed by the NPRM.

Section by Section Analysis—High Speed Track Standards

Section 213.301—Scope of Subpart

Proposed rule: Subpart G applies to track required to support the passage of passenger and freight equipment in specific speed ranges higher than those permitted over Class 5 track. For those speeds above Class 5, the track and the vehicles operated on the track must be considered as an integral system. Of course, conventional passenger equipment has been operated for decades by many railroads at speeds up to 110 m.p.h. and on the Northeast Corridor by Amtrak and its predecessors at speeds up to 125 m.p.h. This subpart does not apply to technologies such as magnetic levitation that do not use flanged wheel equipment.

Comments: No comments were received pertaining to this section.

Final rule: A minor change in this section clarifies that Subpart G begins at a speed greater than 90 miles per hour (not at 91 miles per hour) for qualified passenger equipment and a speed greater than 80 miles per hour (not 81 miles per hour) for qualified freight equipment.

Section 213.303—Responsibility for Compliance

Proposed rule: Only two response options are available under this paragraph. Track owners who know or have notice of non-compliance with this subpart may either bring the track into compliance with the subpart or halt operations over that track. This section does not offer the railroad the option of operating under this subpart with the supervision of a qualified person, as in the standards for track Classes 1 through 5. Such an option would permit too much opportunity for disaster from human error. Under this subpart, if a track does not comply with the requirements of its class, it must be repaired immediately or train speeds must be reduced to the maximum speed for the track class with which the track complies. It may be necessary on occasion for the track owner to reduce the class of track to Class 5 or below. When this occurs, the requirements for the lower classes (1–5) will apply.

Comments: No comments were received pertaining to this section.

Final rule: FRA decided to delete the proposed subsection (d), which discussed directed service by the Surface Transportation Board, because this provision is not needed in the high speed context.

FRA decided to add a new subsection (d) of this section to include in the category of those responsible for compliance with the track standards those who perform the function of complying with the standards, not just the track owner. This is consistent with the counterpart regulation for Classes 1 through 5 track in § 213.5(f). It conforms to the authority given FRA by the statute. *See* 49 U.S.C. 21301 and 1 U.S.C. 1.

Section 213.305—Designation of Qualified Individuals; General Qualifications

Proposed rule: Work on or about a track structure supporting qualified high speed passenger trains demands the highest awareness of employees about the need to perform work properly.

A person may be qualified to perform restorations and renewals under this subpart in three ways. First, the person may combine five or more years of supervisory experience in track maintenance for 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. Second, a person may be qualified by a combination of at least one year of supervisory experience in track maintenance of Class 4 or higher, 80 hours of specialized training or in a college level program, supplemented with on-the-job training. Under the third option, a railroad employee with at least two years of experience in maintenance of high speed track can achieve qualification status by completing 120 hours of specialized training in maintenance of high speed track, provided by the employer or by a college level engineering program, supplemented by special on-the-job training.

Similarly, a person may be qualified to perform track inspections in Classes 6, 7, 8 and 9 by attaining five or more years of experience in inspection in track Class 4 or higher and by completing a course taught by the employer or by a college level engineering program, supplemented by special on-the-job training. Or, the person may be qualified by attaining a combination of at least one year of experience in track inspection in Class 4 and higher and by successfully completing 80 hours of specialized training in the inspection of high speed track provided by the employer or by a college level engineering program, supplemented with on-the-job training. Finally, a person may be qualified by attaining two years of experience in track maintenance in Class 4 and above and by successfully completing 120 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. The third option is intended to provide a way for employees with two years of experience in the maintenance of high speed track to gain the necessary training to be qualified to inspect track.

For both categories of qualifications, the person must have experience in Class 4 track or above. To properly maintain and inspect Class 4 track or higher requires a level of knowledge of track geometry and track conditions that are not as readily obtained at lower classes. Persons who are qualified for high speed track must know how to work, maintain, and measure high quality track. Experience in Class 4 track is established as a lower limit to provide a pool of candidates, that may be drawn from freight railroads, who would provide the necessary experience on well-maintained track.

This section also includes specific requirements for qualifications of persons charged with maintaining and inspecting CWR. Training of employees in CWR procedures is essential for high speed operations. Each person inspecting and maintaining CWR must understand how CWR behaves and how to prevent track buckles and other adverse track reactions to thermal and dynamic loading.

Comments: No comments were received pertaining to this section.

Final rule: A minor change to subsection (e) has been made to clarify that records must be maintained for those employees qualified to supervise movements over broken rails.

Section 213.307—Class of Track: Operating Speed Limits

Proposed rule: For several years, passenger service on the Northeast Corridor has operated at 125 m.p.h. under conditional waivers granted by FRA. Amtrak has established specific procedures for this category of speed from which the railroad industry has accumulated valuable knowledge about track behavior in this speed range. The speed of 125 m.p.h. is the natural boundary for the maximum allowable operating speed for Class 7 track. Because trainsets have operated in this country at speeds up to 160 m.p.h. for periods of several months under waivers for testing and evaluation, the maximum limit of 160 m.p.h. is established for Class 8. In the next several years, certain operations may achieve speeds of up to 200 m.p.h. Class 9 track is established for this possibility. The exceptions for the maximum allowable operating speeds for each class of track parallels the standards for the lower classes, except that a speed of 10 m.p.h over the maximum intended operating speeds is permitted during the qualification phase per Section 213.345.

Although high speed rail is most often considered in terms of passenger travel, non-passenger high speed train service (*e.g.,* the mail trains operated by Amtrak on the Northeast Corridor) is also a possibility. All equipment, whether used for passenger or freight, must demonstrate the same vehicle/track performance and be qualified on the high speed track. Hazardous materials, except for limited and small quantities, may not move in bulk on trains operated at high speeds. The limitations noted are similar to those involved in commercial passenger and freight air travel.

Comments: The Florida Overland eXpress commented that a reference to that project in the section-by-section analysis of the NPRM may seem to erroneously suggest that the requirements established for Class 9 track apply to that project.

Final rule: FRA agrees that the language in the preamble to the NPRM may have been confusing. This analysis clarifies that Subpart G is not applicable to the Florida Overland eXpress. The proposed rule itself did not reference that proposed operation, so the language in the rule remains unchanged for the final rule.

FRA does not presently foresee authorization of mixed passenger and conventional freight operations above 150 m.p.h. Accordingly, passenger equipment safety standards, as proposed, address equipment for speeds only to 150 m.p.h. FRA expects to handle service above 150 m.p.h. through rules of particular applicability. Nevertheless, standards contained here are useful benchmarks for future planning with respect to track/vehicle interaction, track structure, and inspection requirements.

Section 213.309—Restoration or Renewal of Track Under Traffic Condition

Proposed rule: This section addresses two elements of concern: (1) that the stability of the track structure not be significantly degraded and (2) that roadway worker safety not be compromised. For restoration under traffic conditions, this section allows only track maintenance that does not affect the safe passage of trains and involves the replacement of worn, broken, or missing components or fastenings or minor levels of spot surfacing.

Comments: No comments were received pertaining to this section.

Final rule: The section as proposed is adopted in this final rule.

Section 213.311—Measuring Track Under Load; section 213.317 Waivers; section 213.319 Drainage

Proposed rule: Proposed language for these sections is identical to the similar sections for track Classes 1 to 5 (§§ 213.13, 213.17, and 213.33).

Comments: Refer to the corresponding sections in classes 1–5 for comments.

Final rule: The sections as proposed are adopted in this final rule, with minor language changes to § 213.317.

Section 213.321—Vegetation

Proposed rule: These sections are identical to the corresponding sections in the standards for track Classes 1 though 5.

Comments: Refer to the corresponding sections in classes 1–5 for comments.

Final rule: The section as proposed is adopted in this final rule.

Section 213.323—Track Gage

Proposed rule: This section introduces limits for change in gage. Analysis has shown that an abrupt change in gage can produce significant wheel forces at high speeds. The minimum and maximum limits for gage values Classes 6, 7, 8 and 9 were set to minimize the onset of truck hunting.

Comments: No comments were received pertaining to this section.

Final rule: With the exception of one minor change, the section as proposed is adopted in this final rule. The title of the heading in the fourth column of the gage table was changed from ''the change of gage in 31 feet'' to ''the change of gage within 31 feet'' to clarify that the change of gage parameter applies between two points anywhere within a 31-foot distance along the track, including two points exactly 31 feet apart.

Section 213.327—Alinement

Proposed rule: Uniformity is established by averaging the offset values for nine points centered around each point along the track at a spacing specified in the table. Uniformity defined in this way applies anywhere—curves, tangent segments, and spirals. Analysis has shown that points in transition areas such as around the ''point-of-spiral-to-curve'' can be included in this averaging technique. No distinction is made as to where the uniform calculation takes place. Tangent, curve, and spiral transitions have historically been difficult to determine in the field. The use of the uniformity filter obviates the need to make determinations based on the identification of these transitions.

This section provides three chord lengths for different types of vehicle/track interaction modes. Chords of 31-, 62-, and 124-foot lengths provide control of single and multiple defects in the wavelength bands most likely to affect vehicle dynamics and ride quality.

The 62-foot chord was selected because of its proximity to the truck center spacing of most high speed passenger vehicles. In phase carbody resonance modes such as bounce, roll and sway are most affected by track anomalies with a wavelength that is near the truck center spacing. Control of track geometry limits based on the 62-foot chord will help reduce the magnitude of such carbody motion. This chord also is predominantly used for track Classes 1 through 5 and is familiar to track inspection and maintenance personnel.

The 31-foot chord controls short wavelength defects that can result in high wheel forces over a short portion of track. These forces may not produce excessive carbody motion, yet their action on the wheels and truck may cause derailment. Most foreign high speed railroads use a 10-meter chord which is approximately equal in length to the 31-foot chord required in this section.

To control longer wavelengths, most foreign high speed railroads use a 30- or 40-meter chord. The 124-foot chord, which is approximately equal to a 40-meter chord, provides a means to locate and measure longer wavelength track anomalies. These long-wavelength

anomalies provide dynamic input to the high speed rail vehicles and can excite carbody resonance modes at high speeds. Excessive carbody motion can lead to poor carbody accelerations and wheel/rail forces, and in the extreme, may also cause derailment.

Addition of this chord length allows measurement of anomalies with wavelengths up to 300 feet. The Japanese National Railway adopted a 40-meter chord after recent speed increases on its Tokaido line. Research and testing indicated a stronger correlation between carbody motion and track geometry limits based on 40-meter mid-chord offsets.

Comments: No comments were received pertaining to this section.

Final rule: The final rule includes two changes to limits shown in the alinement tables. The permissible limit for track Class 9 for a single alinement deviation for a 124-foot chord is changed from one-half inch to three-quarters inch, and the Class 9 limit for three or more non-overlapping deviations for a 124-foot chord is changed from three-eighths to one-half inch. The limits for these two parameters shown in the NPRM were overly conservative, based on the recommendations of the technical experts who worked with the task group that developed the proposed high speed standards. These recommendations are contained in the report, ''Track and Vehicle-Track Interaction Safety Assurance for U.S. High Speed Rail'', July 1997, which is contained in the public docket for these proceedings.

Section 213.329—Curves, Elevation and Speed Limitations

Proposed rule: The determination of the maximum speed that a vehicle may operate around a curve is based on the degree of curvature, actual elevation, and amount of unbalanced elevation where the actual elevation and curvature are derived by a moving average technique. This approach is as valid in the high speed regime as in the lower classes. The moving average technique recognizes the steady state (one or two second duration) nature of the Vmax formula.

The maximum operating speed for each curve is determined by the Vmax formula:

$$V_{max} = \sqrt{\frac{E_a + E_u}{0.0007D}}$$

where:

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

E_a = Actual elevation of the outside rail (inches).

E_u = Unbalance elevation or cant deficiency

D = Degree of curvature (degrees).

While the cant deficiency proposed in Classes 1 through 5 is three or four inches, cant deficiencies proposed for qualified high speed train are considerably higher. FRA has granted waivers for up to nine inches for revenue service and up to twelve inches for testing for qualified equipment. Higher cant deficiencies are allowed for high speed trains that may include tilting systems. The qualification testing will ensure that the vehicle will not exceed the vehicle/track safety performance limits set forth in this subpart when operating at these higher cant deficiencies.

In order to qualify the vehicle at higher cant deficiencies, the railroad must provide technical testing information using the same procedures that have been used in past years for waivers for higher cant deficiencies. This procedure is commonly called the ''static lean test'' where the vehicle is elevated on one side and wheel loads are measured and the roll angle is determined. Based on acceptable testing information and other technical submissions, FRA will approve the higher cant deficiencies for the specific vehicle type.

The maximum crosslevel on the outside of a curve is established at seven inches. Elevation in excess of that amount presents a safety consideration for freight trains with high centers of gravity, operating at lower speeds in the curve.

Comments: The Bombardier GEC Alsthom Consortium (Bombardier/GEC) commented that this section permits FRA to approve a higher of level of cant deficiency, but the same option does not exist for track classes 1 through 5. Furthermore, Bombardier/GEC urged that the requirements concerning the roll angle between the floor of the vehicle and the horizontal should be deleted and explained that this method was not valid for non-tilting equipment.

Final rule: FRA agrees that the concept of the roll angle would not apply to non-tilting power cars and has changed paragraphs (d)(1) and (2) to apply the requirements for the roll angle only to passenger-carrying equipment. FRA has changed § 213.57 in track Classes 1 through 5 to address the commenter's concern.

FRA has deleted footnote 2 from paragraph (f) of this section because it is no longer necessary. If a waiver previously has been granted to the railroad to operate at a higher level of cant deficiency, the railroad or FRA should have the static lean and other information readily available for consideration of FRA approval required under this section. This will allow the present waiver, including conditional requirements not necessarily compatible with Subpart G, to be replaced with an FRA approval process which incorporates all necessary requirements under this new subpart.

FRA considered the issue of the difference between a curve that has been introduced in high speed track as a result of maintenance or geometry degradation and a curve that was introduced by design. In either case, superelevation may or may not be present and trains may experience an unbalanced condition. FRA believes that the deviations from uniform profile and uniform alinement, as outlined in sections 213.331 and 213.327, will not preclude longer wavelength misalinements on the order of 200 feet or greater that resemble the characteristics of a curve, from being treated as a curve for which the unbalance formula defined in this section will be applied.

Section 213.331—Track Surface

Proposed rule: The chord lengths in the table are selected for the same reasons discussed in § 213.327 (alinement). The multiple chords measure different surface anomaly wavelengths.

The surface table addresses both single and multiple events. Studies have shown that the smaller limits are necessary when surface anomalies repeat themselves three more times over the specified chord length. The parameter commonly called ''warp,'' the difference in crosslevel between any two points, does not require a specific limit for repeated warp conditions at high speeds.

Comments: Bombardier/GEC and the French Ministere de l'Equipment, des Transports et du Logement separately expressed concerns that the limits for track geometry have been extended from the present class 6 standards, permitting more track defects in the high speed track classes. As an example, Bombardier/GEC said that the proposed rule would permit a single 1.25 inch mid-ordinate offset on a 62 ft. chord for a profile condition, compared to the current requirement of 0.5 inch. In addition, Bombardier/GEC questioned why the difference in crosslevel between two points less than 62 feet apart is lower for Classes 4 and 5 track than it is for Classes 6 through 9 track. Bombardier/GEC urged that the values for all the geometry limits be ''verified by industry'' before the rule is

promulgated. The Bombardier/GEC also pointed out that the titles in the tables defining surface requirements should not have the ''inches'' in them since class of track is not defined in inches.

The AAR commented that the NPRM included an inconsistency between § 213.63 for track Classes 1 to 5 and § 213.331 in regard to repeated low joints. The AAR suggested that footnote 2 to the warp parameter (the difference in crosslevel between any two points less than 62 feet apart) should apply to § 213.331 for track Classes 6 through 9. The AAR notes that a condition which is a defect in track Classes 1 through 5 should also be a defect in the higher track classes.

Final rule: FRA has adopted the proposed geometry standards except for a few changes in the limits for the track profile parameter. The changes in the profile parameters are based on a recent study conducted at the VNTSC.

FRA believes it is crucial to revise the standards for Class 6 track. Years of experience by Amtrak on the Northeast Corridor indicate a lack of correlation between the former Class 6 standards and adverse vehicle responses. Adverse vehicle response occasionally occurred on track that was in compliance; on the other hand, track that was not in compliance sometimes did not contribute to any adverse vehicle response.

In response to the concern that the ''warp parameter'' permits a greater difference in crosslevel between any two points less than 62 feet apart for the higher classes than is permitted in the lower classes, FRA notes that the limit established for Classes 6 through 9 track, one and one-half inches, is the same limit established for Class 5 track. Therefore, FRA does not believe that a discrepancy exists. In addition, FRA believes the format in the surface tables in this section does not need modification since it is similar to the surface table in § 213.63 for the lower classes, a format that has been used in the track standards for many years.

The geometry standards are based on the recommendations of a panel of experts who conducted extensive studies, reviewed foreign practice, and recommended to the RSAC the safety limits shown in the proposed rule. The recommendations of this panel are contained in a working paper dated July, 1997, and entitled ''Track and Vehicle Interaction Safety Assurance for U.S. High Speed Rail.'' The working paper is part of the docket for this proceeding. The proposed high speed standards were based on the principle that the high speed track and the equipment operating on high speed track are an integral system.

Following the publication of the NPRM, the VNTSC completed a report entitled ''Evaluation of Proposed High Speed Track Surface Geometry Specification'', dated November 10, 1997, which is in the docket of these proceedings. The study describes an evaluation of the responses of different high speed locomotive designs to track profile geometry variations. The working paper focuses on a comparative analysis of high speed locomotive designs with carbody-mounted traction motors and locomotive designs with truck-mounted traction motors. The minimum amplitudes of track profile variations required to cause excessive vertical accelerations in the operator's cab and to cause suspension bottoming are compared with the maximum amplitudes prescribed in the proposed high speed standards. The analysis shows that a locomotive design with truck-mounted traction motors requires an approximately 33 percent smaller track profile variation amplitude to cause excessive vertical accelerations than a locomotive design with carbody-mounted traction motors. These results indicate that a locomotive with truck-mounted traction motors may exceed the proposed minimum safety limits for a single profile event that were proposed in the NPRM for Subpart G.

In light of those findings, FRA has adopted the proposed surface limits contained in the NPRM, except that the geometry limits for profile are reduced, based on the results of the VNTSC study. This final rule requires that the deviation from uniform profile on either rail at the midordinate of a 31-foot chord may not exceed one inch for track Classes 6 and 7. The deviation from uniform profile on either rail at the midordinate of a 62-foot chord has now been set to one inch for track Classes 6, 7 and 8 and three-quarters of an inch for track Class 9. Similarly, for three or more non-overlapping deviations in track surface, each deviation from uniform profile on either rail at the midordinate of a 31-foot chord may not exceed three-quarters of an inch for track Classes 6 and 7. Also, for three or more non-overlapping deviation in track surface, each deviation from uniform profile on either rail at the midordinate of a 62-foot chord has been changed to three-quarters for track Classes 6, 7 and 8 and one-half inch for track Class 9.

FRA concurs with the comments made by the AAR in regard to repeated low joints. For consistency with § 213.63, footnote two with a minor modification has been added to the table in § 213.331(a).

Section 213.333—Automated Vehicle Inspection Systems

Comments were received from Amtrak and from Bombardier/GEC in regard to the proposed requirements for automated measurement systems. These systems include the track geometry measurement system, the gage restraint measurement system, and the systems necessary to monitor vehicle/track interaction (acceleration and wheel/rail force requirements). Because of the complexity of these systems and the technical nature of the comments, the following discussion addresses each automated measurement system separately in the order of the paragraphs in the proposed rule.

Track Geometry Measurement System (TGMS), Paragraphs (a) Through (g)

Proposed rule: Railroads that operate trains at speeds above 110 m.p.h. universally employ automatic track geometry measuring systems to generate data to point out train safety hazards in the track structure. Reliance upon only visual inspections to locate small track irregularities is difficult. In France, track geometry measuring vehicles are operated quarterly over high speed lines for the purpose of collecting track maintenance data.

Comments: Comments were received concerning the track geometry system.

Final rule: No changes to paragraphs (a) through (g) were made in the final rule.

Gage Restraint Measurement System, Paragraphs (h) and (i)

Proposed rule: The GRMS is primarily used on timber-tied track of certain freight railroads, to evaluate the effectiveness, on a continuous basis, of rail/tie fastening systems. This section requires the use of GRMS in Classes 8 and 9 to measure the gage restraint of the track, including the strength of the ties and the ability of the fastenings to maintain gage. Specified safety limits were established after testing on the Northeast Corridor where the track is predominately concrete-tied with timber tie turnouts. GRMS on concrete ties is effective in identifying defective ties and conditions with missing fasteners or a relaxation of toe load of gage-side rail fasteners. GRMS is required in Classes 8 and 9 to measure the resistance of the track to forces generated by wheel flanging in the gaging space. The use of the GRMS is necessary to insure sufficient gage restraint at the gage limits set to control truck hunting.

Comments: Bombardier/GEC commented that the GRMS requirements are unnecessary. It stated

that the GRMS could be a beneficial tool when used to inspect lower classes of track built with wooden ties, and any requirement for regular GRMS inspection should be limited to lower track classes and tracks with wooden ties where a cost/safety benefit can be shown.

Final rule: FRA does not agree with the recommendation that the GRMS be restricted to timber-tied track. While most of the industry's GRMS experience has been on timber-tied track, FRA and Amtrak jointly conducted a program to evaluate the performance of FRA's GRMS on the Northeast Corridor, a route with large numbers of concrete ties. This joint evaluation program indicated that the GRMS is an important safety tool for the measurement of gage restraint in concrete ties, as well as timber ties. The evaluation program also concluded that the optimum GRMS safety criterion for concrete ties is the gage-widening ratio (GWR) which is based on the unloaded track gage, loaded track gage and actual lateral load applied.

The GWR limit to the high speed standards is a completely different concept than the application of the GRMS technology discussed for the lower track classes. This preamble describes various proposals for implementation of GRMS technology for lower track classes, such as the use of a GRMS to supplant certain crosstie and fastener requirements in the track safety standards. While the GRMS is new to the high speed environment, FRA concludes that GRMS inspections in the higher classes is important to confirm the safety of crossties and fasteners. The GRMS is an important tool which has been proven to identify missing fasteners and help locate other conditions that can affect the ability of both timber and concrete crossties to maintain track gage.

Paragraphs (h) and (i) are unchanged from the proposed rule with two exceptions. Since there is no requirement to calculate Projected Loaded Gage (PLG24) in Classes 8 and 9, the reference to PLG 24 has been removed from the final rule. Several other minor word changes have been made in the language of the rule text to agree with the current language being proposed by the GRMS Task Group.

Vehicle/Track Safety Measurement Systems, Paragraph (j)

Proposed rule: The proposed rule required functional carbody and truck frame accelerometers on at least two vehicles of every train in track Classes 8 and 9. The track owner would be required to have in effect written procedures when these devices indicate a possible track-related condition.

Comments: Both Amtrak and Bombardier/GEC in separate comments state that the requirements in paragraph (j) are unnecessary. Both commenters objected to the requirement for accelerometers on every train, except for lateral truck frame accelerometers, and also objected to the requirement for written procedures for the notification of track personnel. The commenters argued that such a requirement would likely create significant availability problems for various operators due to the reliability of such permanently installed equipment.

In its comments to the docket, Amtrak re-evaluated an earlier endorsement of a requirement for carbody accelerometers on every train and now recommends that this paragraph be replaced with a requirement for written procedures when on-board crews report indication of a possible track-related condition. Amtrak said that it had earlier assumed that these monitoring systems would be autonomous ''black boxes'' that would be on each train and report exception to the engineer or directly to the dispatcher. Amtrak said that further investigation into the application of this requirement raised doubts about the necessity for the frequency of the monitoring as well as the ability of an operator to ensure compliance with that frequency because ''track deterioration is a slow process occurring over long periods of time.'' In addition, Amtrak stated that it has had in place for years a process by which engineers report rough track when they encounter it.

Final rule: FRA has received widely differing opinions about the use of accelerometers on daily trains. Some experts point out that accelerometers on every train would be extremely useful to locate track conditions that may need correction. Other experts have differing opinions. The French National Railway (SNCF), for example, employs lateral truck-mounted accelerometers to address truck hunting on every train, but uses vertical and lateral carbody accelerometers only on a vehicle which inspects about twice each month. Those who advocate accelerometers on two cars in every train believe that they may indicate a track-caused response if both vehicles exhibit similar readings. On the other hand, if only one vehicle shows a high acceleration, the cause may be attributed to the dynamics of that vehicle only, not the track. Some experts believe that a requirement to equip every train with carbody and truck frame accelerometers would be costly to implement and would have questionable safety benefits.

However, many experts believe that a requirement for carbody and truck frame accelerometers on one train per day would accomplish several important safety goals that can not be achieved with a periodic program such as the one on the SNCF. The principal advantage is that conditions such as a culvert this is settling would be identified before the next periodic inspection.

While FRA agrees with the commenters that lateral and vertical accelerometers on every train would be unnecessary and that track does generally deteriorate slowly, FRA believes that some undesirable track geometry conditions may occur between periodic inspections for geometry and vehicle/track safety. The engineer's subjective perception of rough track conditions would be enhanced with available technology. FRA concludes that a requirement for functioning carbody and truck-mounted accelerometers on at least one train per day is needed to address those conditions that may occur on a daily basis, such as a culvert which has settled or a track condition that may be inadvertently introduced during track repair. These conditions may not be noticeable to a locomotive engineer.

The final rule is changed to require that 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. The implementation of this requirement and the extent of human involvement in the process and the specific acceleration levels that would trigger notification of track personnel is being left up to the railroad.

Paragraph (k)

Proposed rule: In paragraph (k), the proposed rule requires that for track Classes 7, 8 and 9, an instrumented car having dynamic response characteristics 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 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 on the vehicle's floor level and lateral truck-mounted accelerometers. If the carbody lateral, carbody vertical, or truck frame lateral safety limits in this section are

exceeded, speeds will be reduced until these safety limits are not exceeded.

Comments: Both Amtrak and Bombardier/GEC were generally supportive of this paragraph which requires periodic measurements of truck frame and carbody accelerations. Amtrak recommended that two vehicles be used, rather than one, and Bombardier/GEC questioned the requirement that the accelerometers be mounted above the axle where they would be subjected to damage from snow, ballast, and debris. Bombardier/GEC also stated that the rule should make clear what the remedial action should be taken when these limits are exceeded.

Final rule: FRA agrees with the comments regarding the placement of the accelerometers and has revised the paragraph to clarify the remedial action that must be taken when these safety limits are exceeded. Paragraph (k) is changed to remove the requirement that the accelerometers on the truck frame shall be mounted ''directly above the axle.'' Instead the accelerometers must be mounted on the truck frame. While Amtrak's recommendation that two vehicles be equipped with the accelerometers, FRA concludes that one inspection vehicle when combined with the daily monitoring of accelerometers and the other inspection requirements in the rule, will provide the necessary level of safety. For clarification, the rule is changed to require that ''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.'' These changes clearly indicate that when the vehicle/track interaction safety limits are exceeded on the inspection vehicle, the speeds of all trains, not just the test train, shall be reduced until the source of the exception is corrected, whether track or vehicle-related.

Paragraph (l)

Proposed rule: In this proposed section, paragraph (l) would require, for track Classes 8 and 9, a car equipped with instrumented wheelsets to be operated annually to ensure that the wheel/rail force safety limits are not exceeded.

Comments: Bombardier/GEC stated that the rule as proposed is not clear about whether the requirement for an annual measurement of wheel/rail forces using instrumented wheelsets is intended to ''re-qualify the rolling stock, or verify the quality of the track.'' Bombardier/GEC stated that, based on the practices of all operators of high speed equipment around the world, there is no reason to re-qualify a vehicle design once it has been properly qualified. Bombardier/GEC also commented that if the intent of the measurement is to verify the condition of the track, it will be less effective as an indicator than information obtained from the other requirements in the rule that are specifically included for that purpose and which are conducted more frequently. Bombardier/GEC also recommended a few technical changes to the table of vehicle/track interaction safety limits.

Final rule: The commenter recommends that the measurement of wheel/rail forces is only necessary during the qualification period and is not necessary to be employed for periodic inspections. The SNCF relies on accelerometers for the purpose of confirming the safety of its high speed system; however, other high speed railroads use instrumented wheelsets on a regular basis to monitor wheel/rail forces. The final rule establishes safety criteria for both accelerometers and wheel/rail forces that must be monitored during the life of the system. FRA does not agree with the comment that accelerometer measurements alone will ensure safety.

The vehicle/track interaction safety limits are the cornerstone of the high speed standards. Vehicle/track interaction has critical consequences in railroad safety, and so establishing safe parameters and developing a measurement system to adhere to those parameters is highly important for any track safety program. There are several hazardous and unacceptable vehicle/track interaction events that are well-known in railroad engineering, and for the most part, may occur on existing high speed operations, including wheel climb, rail roll-over, vehicle overturning, gage widening, and track panel shift.

The safety limits contained in the Vehicle/Track Interaction Safety Limits table are derived from technical literature, years of research, experience by foreign railroads, and computer simulation and validation. They must not be exceeded either during the qualification phase required under § 213.345 or in the periodic measurement of accelerations and wheel/rail forces required in this section.

The minimum vertical wheel load safety limit is 10 percent of the static vertical wheel load. The static vertical wheel load is defined as the load that the wheel would carry while stationary on level track. These safety criteria assure that no excessive wheel unloading is experienced by any wheel on the operating vehicle. Significant wheel unloading greatly increases the risk of derailment in the dynamic environment of a vehicle traveling at high speed.

The ratio of the lateral force that any wheel exerts on an individual rail to the vertical force exerted by the same wheel on the rail (L/V ratio) is limited by the Nadal formula. The limit on any wheel's L/V ratio ensures that the risk of a wheel climb derailment is minimized. The wheel flange angle (δ) referenced in the formula should correspond to actual measurements of wheel flange angle as provided by the requirements of the vehicle qualification testing specified in § 213.345.

The net axle lateral force exerted by any axle on the track should not exceed 50 percent of the static vertical load exerted by the same axle. This safety criterion ensures that no excessive track panel shift or misalinement is produced by the moving vehicle. For vehicles operating at high speeds, track panel shift can produce unsafe carbody and/or truck motion and, in the extreme, can cause derailment.

The ratio of the lateral forces that the wheels on one side of any truck exert on an individual rail to the vertical forces exerted by the same wheels on that rail must not exceed 0.60. This limit ensures that the risk of a rail rollover derailment is minimized.

The lateral carbody peak-to-peak acceleration (defined by the algebraic difference between the two extreme values of measured acceleration within a one-second duration) is limited to 0.5 g. Carbody lateral accelerations above this limit reflect a very poor ride quality and a degraded track and/or vehicle condition.

The vertical carbody peak-to-peak acceleration (defined by the algebraic difference between the two extreme values of measured acceleration within a one-second duration) is limited to 0.6 g. Carbody vertical accelerations above this limit also reflect a poor ride quality and a degraded track and/or vehicle condition.

The Root Mean Square (RMS) of the lateral truck acceleration for any two-second duration is limited to 0.4 g. This safety limit ensures that no sustained truck hunting is experienced by the moving vehicle. Sustained truck hunting produces undesirable ride quality and significantly increases the risk of derailment. The RMS of the lateral truck acceleration must be calculated over a two-second window from which the mean value of the acceleration has been removed. The vertical truck zero-to-peak acceleration

is limited to 5.0 g. Exceeding this safety limit can indicate undesirable short wavelength track anomalies.

Ultimately, vehicle/track interaction safety is assured by controlling wheel/rail forces to safe limits. Appropriate limits for track geometry and vehicle response acceleration provide strong indications of the likely wheel/forces which would be produced by operating trains. Use of an instrumented wheelset also provides a level of safety assurance for new and unusual vehicle designs that differ from the conventional vehicle dynamic models that were used to develop the track geometry and vehicle/track interaction limits.

FRA believes that an annual inspection using functioning instrumented wheelsets must be implemented as part of a high speed inspection strategy that includes visual inspections, geometry car inspections, periodic carbody and truck-mounted accelerometer measurements, and other inspections deemed necessary.

The measurement of wheel/rail forces and accelerations is necessary to confirm that the vehicle/track system is performing within safe limits. The Japanese National Railway, for example, employs instrumented wheelsets to measure wheel/rail forces at a frequency of approximately every three months. The purpose of the periodic measurement of wheel/rail forces required in this paragraph is to monitor, or in a sense ''requalify,'' the vehicle/track system, not to ''requalify'' only the track or only the vehicle design. Neither the track nor the vehicles on the high speed track can be considered in isolation; they must be monitored together as a system.

The final rule contains a few changes to the table of vehicle/track interaction safety limits. A 25 Hz filter is specified so that important high speed events will not be filtered from the data and the location of truck frame accelerometers is changed in Footnote 3.

Paragraph (m)

Proposed: Paragraph (m) requires the track owner to maintain a copy of the most recent exception printouts for the inspection required under paragraphs (k) and (l) of this section.

Comments: No comments were received concerning this paragraph.

Final rule: The paragraph as proposed is adopted in this final rule.

Section 213.335—Crossties

Proposed rule: Various types of crossties may be installed in high speed track provided that the ties maintain the proper gage, surface and alinement. Slab track (track imbedded in concrete) or other construction may also be used if the construction complies with the requirements of this section. Because of the wide use of concrete ties in high speed track throughout the world, this section establishes safety requirements for concrete ties.

The requirements for crossties in this subpart differ from those in the corresponding section for crossties in Classes 1 through 5. For non-concrete-tied construction, the requirements for ties parallel those of the lower standards except that permissive lateral movement of tie plates is set at ⅜ inch instead of ½ inch and a requirement for rail holding spikes is added.

For concrete-tied track, effective ties must not exhibit the known failure modes listed. These failure modes were derived largely from experience in the Northeast Corridor. The number and distribution requirements of both non-concrete ties and concrete ties is more stringent than the requirements for the lower classes. For example, 14 effective concrete crossties are required in Class 6, and 16 effective concrete ties are required in Classes 7, 8 and 9 in each 39-foot segment of track. For both concrete and timber construction, a minimum number of non-defective ties is specified on each side of a defective tie.

Comments: The AAR commented that a discrepancy exists in that paragraph (e) is inconsistent with the required location of crossties at rail joint locations for lower speed operations covered by § 213.109.

Final rule: Review of this section also reveled a typographical mistake which is being corrected; in paragraphs (c)(6) and (d)(6), ''Able'' is changed to ''So unable.'' The discrepancy was inadvertent and has been corrected. The measurement is changed from 25 inches to 24 inches in paragraph (e) to make this subsection consistent with the requirements for the lower track classes.

Section 213.337—Defective Rails

Proposed rule: The requirements for the identification of rail flaws and appropriate remedial action are valid in high speed track classes as well as the lower track classes. This section is unchanged from the standards for the lower classes except that language references to specific lower classes are deleted as unnecessary. Surface conditions such as corrugation, shelling, spalling and checking are not included in the high speed rail defect table since these conditions, if they were to progress to a severe level, would contribute to dynamic loading conditions that are addressed by the requirements for vehicle/track interaction in § 213.333. The flattened rail head is especially important to identify in high speed track because of the adverse effect on track geometry caused by this short anomaly in the surface of the rail head.

Comments: No comments were received pertaining to this section.

Final rule: To improve clarity, definitions were added and a small change was made to include brackets around some items in the rail flaw table so that this section is identical to the corresponding section in the lower track classes.

Section 213.339—Inspection of Rail in Service

Proposed rule: A continuous search for internal rail defects must be made of all rail in track in track Classes 6, 7, 8 and 9 at a frequency of twice per year. This requirement is consistent with the frequency used on Amtrak's Northeast Corridor (essentially, Class 6 and 7) and as well as the approach used in France which inspects rails twice a year.

Comments: No comments were received concerning this section.

Final rule: The final rule for this section is unchanged from the proposed rule.

Section 213.341—Initial Inspection of New Rail and Welds

Proposed rule: This section provides for the initial inspection of new rail, either at the mill or within 90 days after installation, and for the initial inspection of new welds made in new or used rail. It also provides for alternatives for these inspections. Compliance with the initial inspection of new rail and welds may be demonstrated by in-service inspection, mill inspections, welding plant inspections, and inspections of field welds.

Comments: No comments were received concerning this section.

Final rule: The final rule for this section is unchanged from the proposed rule.

Section 213.343—Continuous Welded Rail (CWR)

Proposed rule: As with CWR for the lower classes of track, FRA will review the railroad's written procedures for the installation, adjustment, maintenance and inspection of CWR, and training for the application of these procedures.

Comments: No comments were received concerning this section.

Final rule: The final rule is unchanged from the proposed rule for this section.

Section 213.345—Vehicle Qualification Testing

Proposed rule: All rolling stock, both passenger and freight, must be qualified for operation for its intended class. This section ''grandfathers'' equipment that has already operated in the specified classes. Rolling stock operating in Class 6 within one year prior to the promulgation of this rule shall be considered as qualified. Vehicles operating at Class 7 speeds under conditional waivers prior to the promulgation of the rule are qualified for Class 7 at the current level of cant deficiency. This includes equipment that is presently operating on the Northeast Corridor at Class 7 speeds.

The qualification testing will ensure that the equipment will not exceed the vehicle/track performance limits specified in § 213.333 at any speed less than 10 m.p.h. above the proposed maximum operating speed. Testing at a maximum speed at least 10 m.p.h. above the proposed operating speed is required. The test report must include the design flange angle of the equipment that will be used for the determination of the lateral to vertical wheel load safety limit for the vehicle/track performance measurements required in § 213.333(k).

Subsection (d) requires the operator to submit an analysis and description of the signal system and operating practices to govern operations in Classes 7, 8 and 9. This submission will include a statement of sufficiency in these areas for the class of operation intended. Based on test results and submissions, FRA will approve a maximum train speed and value of cant deficiency for revenue service.

Comments: Bombardier/GEC stated that this part of the proposed rule is intended to be followed to qualify equipment types for their intended operation on a specific route, not to determine the operating limits of the equipment and track, as stated. Bombardier/GEC said that to achieve this, it is recommended that the words ''* * * and conduct a test program sufficient to evaluate the operating limits of the track and equipment'' be replaced with ''* * * and conduct a test program sufficient to evaluate the safe operation of the equipment for the intended service.''

Bombardier/GEC said that it is not practical to include a requirement to suspend the vehicle qualification tests at the speed where any of the vehicle/track performance limits in § 213.333 are exceeded. The qualification tests, according to Bombardier/GEC, should be completed to determine the safe operational limits for the equipment throughout the route. In addition, the specific location of all violations should be recorded and the condition of the track in those locations should be checked to determine if the non-compliance is related track or equipment.

Final rule: FRA believes that it is important not to emphasize the vehicle component in the qualification testing. The purpose of this section is not to conduct a test program to evaluate the safe operation of the equipment, but to qualify the vehicle/track system. The consideration of the high speed track and the vehicles together as an integral system is fundamental to the approach adopted in this final rule. To evaluate the system, a test program shall demonstrate vehicle dynamic response as speeds are incrementally increased from acceptable Class 6 limits to the target maximum test speeds.

The commenter believes that the tests should not be suspended when the safety limits are reached. However, these safety limits are set at levels where continued operation could result in a derailment. FRA does not believe it would be prudent to continue the testing on that portion of track if these safety limits are reached. However, the rule is not intended to imply that all testing must be stopped. It can continue, but the locations where the limits are reached must be identified and test speeds may not be increased at those locations until corrective action is taken. This action may be an adjustment in the track, in the vehicle, or in both of these system components.

FRA has considered the consistency of this final rule with the proposed Passenger Equipment Safety Standards, **Federal Register**, September 23, 1997, and has changed § 213.345(b) to state that the testing will not exceed the wheel/rail force safety limits and the truck lateral accelerations specified in § 213.333 and the vertical and lateral carbody acceleration levels listed in (b)(1), (2), and (3). FRA believes the tighter ride quality limits in the proposed Passenger Equipment Safety Standards are more appropriate for a new system. However, as the equipment and track wear, those tighter ride quality limits which were used at the time of system qualification should be used to establish long-term maintenance levels, and the limits contained in § 213.333, which are minimum safety levels, should be used during the life of the system to monitor safety.

A small change has been added to § 213.345(a) which now states that all rolling stock types which operate at Class 6 and above speeds shall be qualified. This change emphasizes that trains which operate at Class 5 speeds or lower on the high speed line do not need to be qualified to operate on the high speed track.

The rule in § 213.345(e) requires the railroad to submit an analysis and description of the signal system and operating practices to govern operations in Classes 7, 8 and 9. FRA has modified § 213.345(f) to make it clear that trains shall not operate in revenue service until FRA has approved a maximum train speed and value of cant deficiency based on FRA's review of the test results and the other submissions by the track owner.

Section 213.347—Automotive or Railroad Crossings at Grade and Moveable Bridges

Proposed rule: There are no highway or railroad grade crossings on the Amtrak route between Washington, D.C. and New York City. Much of this line is operated by revenue passenger trains at 125 m.p.h. (Class 7 speeds). Highway crossings and railroad crossings at grade (diamonds) may not be present in Class 8 and 9 track.

Technology currently is being developed that would prevent inappropriate intrusion of vehicles onto the railroad rights-of-way. This technology involves the use of barrier systems with intrusion detection and train stop, as well as advance warning systems. Because the technology is under development, it would be premature to include specific requirements for barrier systems and related technology in this section. However, the railroad is required to submit for approval a description of the crossing warning system for each crossing.

Comments: No comments were received for this section.

Final rule: A minor addition was added to paragraph (b) to make it clear that trains shall not operate at Class 7 speeds unless an FRA-approved warning/barrier system exists on the track segment and all elements of that warning/barrier system are functioning.

The rule precludes the presence of highway grade crossings and rail-to-rail crossings for the highest speed operations, track Classes 8 and 9. Presently no highway-rail crossings exist on Class 6 track (on Amtrak and commuter railroads), although highway-rail crossings existed for several years on Class 6 track on the Northeast Corridor. FRA believes highway/grade crossings should be limited in the high speed regime. Where highway/rail crossings exist at higher speeds, the

railroad should install the most advance warning/barrier systems available.

FRA is continuing to conduct risk analysis related to treatments for high-speed crossings. To date, the analysis demonstrates that risk to a motorist is not likely to increase with increasing train speeds above 110 m.p.h. On average, collision frequency should not rise (although sight distance may be an issue in individual situations). Accident severity in the range of 80 m.p.h. is already so high that no further increase in the likelihood of fatal injury in the motor vehicle should result from increases in train speed.

However, FRA does not believe that sufficiently refined analytical techniques currently exist to predict the effect of increased speeds on damage to the passenger train through the initial collision, possible derailment, and possible secondary collisions—including interaction among the units in the consist. Collisions with heavy trucks, construction equipment and agricultural equipment are an issue of particular concern. FRA believes it is prudent to take the safe course and ensure against collisions by the most secure means possible, rather than risk the occurrence of a catastrophic event involving multiple fatalities to crew members and passengers.

Section 213.349—Rail End Mismatch

Proposed rule: Vertical or horizontal mismatch of rails at joints must be less than one-eighth of an inch for Classes 6 through 9. A more restrictive criterion is not necessary and would be impractical.

Comments: No comments were received concerning this section.

Final rule: The final rule for this section is unchanged from the proposed rule.

Section 213.351—Rail Joints

Proposed rule: This section is less permissive than its counterpart for the lower speed classes. Fracture mechanics tests and analyses demonstrate that there is no place in the high speed train operating regime for defective joint bars. The propagation rate of a crack large enough to be visible in a joint bar is unpredictable. Once a joint bar has ruptured, its companion joint bar is immediately in danger of overload. Upon discovery of a defective joint bar, the track owner must reduce the track class at the location of the defective bar and proceed according to the requirements of Subpart D.

Comments: No comments were received for this section.

Final rule: The final rule for this section is unchanged from the proposed rule.

Section 213.352—Torch Cut Rail

Proposed rule: This section mirrors the corresponding section (§ 213.122) track Classes 3 through 5. This provision prohibits future torch cutting of rails in high speed track, except for emergency situations. When a rail end is torch cut in an emergency situation, speed over the rail must not exceed the maximum allowable for Class 2 track.

For existing torch cut rails in Class 6 track, all torch cut rails must be removed within six months of the issuance of the final rule of this proceeding. If after six months from the issuance of the final rule of this proceeding any torch cut rail is discovered in Classes 6 through 9 track, it must be removed within 30 days, and speed over that rail must not exceed the maximum allowable speed for Class 2 track until it is removed.

Comments: No comments were received for this section.

Final rule: After further review, FRA determined that the proposed requirement in § 213.352(a)(2) requiring speeds in existing Class 7, 8 and 9 track to be reduced to Class 6 until a torch cut rail is replaced is unnecessary and has been deleted. For existing torch cut rail ends in Class 6 track, all torch cut rail ends, if any, must be removed within six months of this rule. Following the six-month period, if torch cut rail ends are discovered, train speeds over that rail must be reduced to the maximum allowable for Class 2 track until removed.

Section 213.353—Turnouts, Crossovers and Lift Rail Assemblies or Other Transition Devices on Moveable Bridges

Proposed rule: The requirements in this section are similar to those in the lower classes. Fastenings must be intact and maintained so as to keep the components securely in place. Each switch, frog, and guard rail must be free of obstructions that may interfere with the passage of wheels. Rail anchoring is required to restrain rail movement affecting the position of switch points and frogs.

Experience in this country with the maintenance of turnouts and crossovers in high speed territories is limited. The use of conventional switch and frog components in present-day 125 m.p.h. track can produce harsh vehicle response which, while not necessarily unsafe, is likely to be less and less welcome in the future, particularly at train speeds above 125 m.p.h.

Worldwide, the trend for turnouts and crossovers in high speed lines is toward reliance on long switch points and moveable point frogs. Amtrak has some limited experience with these features at fairly high train speeds, and the western coal railroads have a great deal of experience, especially with moveable point frogs, with turnout component performance in low speed, cumulative tonnage conditions. This section requires that the track owner, intending to operate trains at high speeds, to develop a turnout and inspection handbook for the instruction of employees involved in this work. Requirements for switches, frogs, and spring frogs that are present in the standards for the lower classes are not specifically listed, but will be addressed in the railroad's Guidebook.

The purpose of such a document is to encourage formal consideration of problems associated with inspection and maintenance of these track features and to establish a consistent system approach to the performance of related work.

Comments: No comments were received for this section.

Final rule: FRA has added a requirement for the inspection and maintenance of lift rail assemblies and other transition devices on moveable bridges. By introducing this requirement, FRA is not encouraging high speeds over moveable bridges. Currently, the highest speed over a moveable bridge is 70 m.p.h. However, in view of the 1997 accident over a lift rail assembly in New Jersey, FRA believes it necessary to introduce a requirement to inspect these transition devices in the high speed standards to address the potential that lift rail technology may change.

Section 213.355—Frog Guard Rails and Guard Faces; Gage

Proposed rule: The most restrictive practical measurements for these important parameters are included. The limits for guard check and guard face gage are set at a limit that permits minimal wear.

Comments: No comments were received for this section.

Final rule: The final rule for this section is unchanged from the proposed rule.

Section 213.357—Derails

Proposed rule: Because it is essential that railroad rolling stock be prevented from fouling the track in front of a high speed train, this section presents strict requirements for derails to be fully functional and linked to the signal systems.

Comments: A railroad supplier commenting on the NPRM suggested that derails also serve to prevent encroachment of main tracks by

locomotives, trains or maintenance-of-way equipment under power, and should not be excepted only because of grade characteristics. The commenter suggested that a better approach would be to permit this exception only where grade characteristics are favorable (significant ascent toward the main track) and where trains are not permitted to clear the main track. The commenter said that turnouts or crossings connecting to yard leads or branch tracks should not be excepted.

The commenter also recommended that the term ''sidetrack'' be better defined or described to make it clear that the term does not apply to other main tracks, sidings, or rail-to-rail crossings. The commenter was concerned that certain types of derails may be ineffective and described an accident that occurred several years ago when a train moving at over 50 mph passed over a derail. The commenter recommended that the rule include a definition of the term ''derail'' and suggested that turnouts, wheel stops, bollards, etc. may be equally effective in comparison to a conventional block or split point derail. The commenter expressed a concern that gates, chocks, skates, wire ropes, wood ties, etc., do not assure the same type of arresting action. The commenter asked for FRA's position on the removal of a length of rail, a pile of ballast or a bumper post.

The commenter said that the proposed requirement for each derail to be ''interlocked'' with the signal system should be modified and included in 49 CFR Part 236 which establishes requirements for hand-operated switches in ABS and TCS territory. The commenter said that the addition of circuit controllers to independent hand-operated derails in ABS will be costly and that such a requirement would tend to discourage voluntary installation of sidetrack derails on Classes 2 to 6 trackage.

The commenter also recommended that the term ''interlocked'' be replaced with the term ''interconnected'' and suggested that the phrases ''interlocked'', ''maximally restrictive'', ''deployed'', and ''completely functional'' are unfamiliar terms and invite confusion and disagreement. The commenter said that there would be little sacrifice of safety in allowing display of a ''proceed at restricted speed'' aspect on the main train when a sidetrack derail is not in the derailing position. Finally, the commenter suggested that this section be moved to the signal regulations at 49 CFR Part 236 because applicable sections in that part already apply to derails. For example, § 236.205(c) sets forth requirements for an independently operated fouling point derail equipped with switch circuit controller which is not in the derailing position.

Final rule: FRA does not believe it is necessary to move the entire section on derails to the signal rules at 49 CFR Part 236, because the subject of derails is appropriate for the track standards. However, FRA may wish to consider changes in Part 236 at a later date. FRA agrees with many of commenters recommendations.

The terms ''industrial'' and ''sidetrack'' as proposed may lead to confusion. FRA, therefore, has modified the rule to remove these terms and use terminology which is more common to the industry. Paragraph (a) now requires that each track, other than a main track, which connects with a Classes 7, 8 and 9 main track shall be equipped with a functioning derail of the correct size and type. The term ''main track'' has a familiar meaning in the railroad industry and is defined, for example in § 236.831(a) and § 240.7.

FRA believes the exception to the requirement for derails at locations ''where railroad equipment, because of grade characteristics, cannot move to foul the main track'' is reasonable. FRA believes it is not necessary to go beyond this exception to address every conceivable circumstance. FRA points out that § 213.361 requires the railroad to submit a right-of-way plan'' for FRA approval. This plan must contain provision for the intrusion of vehicles from adjacent tracks.

The final rule under § 213.357(b) explains that a derail is a device which will physically stop or divert movement of railroad rolling stock or other railroad on-track equipment past the location of the device. Ineffective piles of ballast, wire ropes, chains, or similar methods are not sufficient. Other methods may be as effective as conventional derails in accomplishing the goal of preventing the railroad equipment from moving into the clearance envelope of the high speed main track.

Paragraphs (c) through (f) of this section mirror the derail requirements for the lower track classes in § 213.205. FRA agrees with the commenter's concern about the term ''interlocked'' because it refers to a particular arrangement of signals. FRA concurs with the commenter's concern that a requirement for derails to be connected to the signal system in Class 6 track would be costly and tend to discourage voluntary installation of derails. To address these concerns, paragraph (g) is changed to read that ''each derail on a track connected to a Class 7, 8 or 9 main track shall be interconnected with the signal system.'' The term ''interconnected'' is consistent with the signal rules in § 235.205, which requires, in part, that circuits shall be installed so that each signal governing train movements into a block will display its most restrictive aspect ''when an independently operated fouling point derail equipped with a switch circuit controller is not in derailing position.''

Section 213.359—Track Stiffness

Proposed rule: Track must have sufficient vertical strength and lateral strength to withstand the maximum loads generated at maximum permissible train speeds, cant deficiency and lateral or vertical defects so that the track will return to a configuration in compliance with the track performance and geometry requirements of this subpart. It is imperative that the track structure is structurally qualified to accept the loads without unacceptable deformation.

The track's resistance to track panel shift is difficult to quantify. However, FRA believes that at a future date, it may be possible, based on ongoing research addressing track panel shift, to further refine the safety limit for the Net Axle L/V Ratio in the table of vehicle/track interaction safety limits in § 213.333. The present limit of 0.5 is based on an extrapolation of the Prud'homme limit and experimental data. An FRA sponsored research program is currently in place addressing the development of criteria and possible safety limits for track shift mitigation which are driven by the proposition that lateral loads generated by vehicles operating under maximum speed, cant deficiency, thermal loads, and initial line defect conditions should not cause the exception of an allowable deflection limit. Depending upon the specific track conditions and vehicle characteristics, permissible net axle lateral to vertical load ratios for an allowable deflection limit can be in the range of 0.4 to 0.6. Key influencing parameters are the track lateral resistance characteristics, tie/ballast friction coefficients, vehicle vertical axle loads, track curvature, thermal loads, and constant versus variable lateral axle loads.

Comments: No comments were received concerning this section.

Final rule: This section is unchanged from the proposed rule.

Section 213.361—Right-of-Way

Proposed rule: This section requires that the track owner to submit a barrier plan, termed a ''right-of-way plan,'' to FRA for approval. The plan will include, at a minimum, provisions in

areas of demonstrated need to address the prevention of vandalism by trespassers and intrusion of vehicles from adjacent rights of way. A particular form of vandalism, the launching of objects from overhead bridges or structures, is specifically listed.

Comments: No comments were received concerning this section.

Final rule: The final rule is unchanged from the proposed rule for this section.

Section 213.365—Visual Inspections

Proposed rule: Visual inspections are considered to be an important component of the railroad's overall inspection program. The section largely parallels the requirements for the lower classes. The inspection requirements are twice weekly for Classes 6, 7 and 8 and three times per week for Class 9. Turnouts and crossovers must be inspected in accordance with the Guidebook required under § 213.353. The practice in France of operating a train at reduced speeds following a period with no train traffic is adopted in this section.

Comments: Bombardier/GEC said that the basis to limit the speed of trains in paragraph (f) to 100 m.p.h. after a traffic interruption of eight hours is not clear. Equipment currently is permitted to run at speeds of 110 m.p.h. on Class 6 track, and up to 125 m.p.h. on the Northeast Corridor on the first run of the day. The proposed rule would limit the speed of these trains to 100 m.p.h. after the track is upgraded to Class 8 or Class 9, if the disruption was greater than eight hours. Bombardier/GEC recommended that the rule require the speed to be reduced to Class 7 speeds if an eight-hour disruption in service occurs on Class 8 track.

Final rule: FRA believes the commenter may be misinterpreting the rule which requires that if no train traffic operates for a period of eight hours in track Classes 8 or 9, a train shall be operated at less than 100 m.p.h. before the resumption of the maximum authorized speed. FRA believes the requirement for one train to operate over the track is not burdensome and follows the practice on the SNCF lines for an early morning pilot train. The rule is unchanged from the proposed rule for this section.

Section 213.367—Special Inspections

Proposed rule: The requirements of this section are the same as those for the lower track classes except that the occurrence of temperature extremes is specifically listed as an event that requires a track inspection.

Comments: No comments were received concerning this section.

Final rule: The final rule for this section is unchanged from the proposed rule.

Section 213.369—Inspection Records

Proposed rule: The requirements of this section are the same as those for the lower track classes.

Comments: No comments were received for this section.

Final rule: FRA has made one small change in paragraph (f). The phrase ''Each Track/vehicle Performance record'' has been changed to ''Each Vehicle/track interaction safety record.'' This change corresponds to the change in the title for the table of vehicle/track interaction safety limits in § 213.333.

Appendix A

Proposed rule: The NPRM proposed to add a curving speed chart based on four inches unbalance. For many years, the track standards included a curving speed chart based only on three inches unbalance. However, the NPRM proposed to allow qualified equipment to operate at curving speeds based on four inches of unbalance, making an additional chart necessary.

Comments: FRA received no comments on the new chart.

Final rule: FRA decided that inclusion of the new chart in Appendix A is necessary to accommodate the provision in the final rule which allows qualified equipment to operate at curving speeds based on four inches of unbalance.

Appendix B

Proposed rule: The NPRM stated that FRA would revise the schedule for civil penalty assessment as it found necessary. At the very least, the schedule would have to be revised to include civil penalties for the new subsections added to the Track Safety Standards. These would include penalties for §§ 213.4(e)(4) and (f) (Excepted track), § 213.119 (Continuous welded rail), § 213.122 (Torch cut rails), and most of the subsections in Subpart G.

Comments: FRA received no comments about the penalty schedule.

Final rule: Under the Debt Collection Improvement Act of 1996 (Pub. L. 104–134, 110 Stat. 1321–373), FRA is required to adjust civil penalties it administers to incorporate the effects of inflation. *See* 28 U.S.C. 2461 note.

FRA added penalties to the Schedule of Civil Penalties to accommodate the new subsections of the final rule. The amounts for the new penalties were chosen based on penalties that have been used in the enforcement of the Track Safety Standards for years. For instance, penalties for violations of most of the substantive subsections of the track standards are either $2,500 or $5,000, the higher penalty being reserved for the more serious violations. For those subsections under Subpart G that have counterparts in Subparts A through F, the new penalties are the same as those for their counterparts. After some consideration, FRA decided not to include generally higher penalties for high speed rail because there are currently few track owners to which Subpart G will apply. However, FRA will reconsider this decision in the future if experience demonstrates the need to assess higher penalties for Subpart G.

Regulatory Impact, Executive Order 12866 and DOT Regulatory Policies and Procedures

This final rule has been evaluated in accordance with existing policies and procedures. The final rule revising the Track Safety Standards is considered to be significant under both Executive Order 12866 and DOT policies and procedures (44 FR 11034, February 26, 1979) because of substantial public interest and safety implications. FRA has prepared and placed in the docket a regulatory analysis addressing the economic impact of the rule. Document inspection and copying facilities are available at 1120 Vermont Avenue, N.W., Seventh Floor, Washington, D.C. Photocopies may also be obtained by submitting a written request to the FRA Docket Clerk at the Office Chief Counsel, Federal Railroad Administration, 400 Seventh Street, S.W., Mail Stop 10, Washington, D.C. 20590.

Ordinarily, in conducting an analysis of the costs and benefits of a proposed or final rule, FRA gathers more extensive economic data than was made available in this proceeding. However, in light of the consensus in the Track Working Group and the majority vote of the RSAC members, FRA does not believe more data is necessary. FRA has relied principally on the recommendations and experience of the railroad industry and labor representatives who, through the RSAC process, helped develop this rule. The working group members provided valuable non-quantitative data on their preferences. Thus, their unanimous consensus on the contents of the rule allows FRA to conclude that the rule is cost beneficial. Although rail labor subsequently withdrew its support for this rulemaking, their objection to the rule did not relate to the finding that the rule is cost beneficial. Furthermore, the railroads, who will bear the burden of

the costs imposed by the rule, have continued to support the rule. In its conclusion, FRA finds that the net effect of the changes to the existing rule is an increase in safety and an increase in the burden on the railroads, but that the burden on the railroads from the changes is not likely to be as great as the benefit, although there was no way to quantify the magnitude on the net benefit.

The Track Working Group formed, reached a consensus on internal working procedures, and addressed the issues. Several issues were delegated to task groups, which are subgroups of the working group. The procedure remained the same. The task groups could make no recommendations until they had a consensus. The working group would not adopt any recommendation, even if a result of a consensus in the task group, until there was a consensus in the working group. The full RSAC would make no recommendation to the Administrator until there was a majority consensus in the full RSAC, even if there was a consensus in the working group.

An implication of this is that no entity represented would accept a consensus agreement, unless the entity he or she represented would be at least as well off after the agreement as it had been before. This analysis therefore uses as a fundamental assumption that there are no provisions which will impose drastic costs on any segment represented by members of the working group, and Pareto superiority of the revised rule over the current rules. Pareto superiority implies that no party would be willing to pay to return to the current standards, although some party might be indifferent between the current standards and the revised standard. There is no implication that this rule is Pareto optimal, although Pareto optimality has not been excluded. Were the rule Pareto optimal, there would not exist another possible set of rules which at least one party would be willing to pay to adopt, and the amount that party would be willing to pay would be sufficient, were it given to other parties, to induce them to agree to the set of rules. Nor is the final rule assumed to be optimal. Were it optimal the total net benefit would be maximized.

The guidance in E.O. 12866 is that we should select the rule with the maximum net benefit. We believe we have done that here, because no party who is burdened by the rule objected in comments to the docket following publication of the NPRM. What we know is that the revised rule is closer to the optimum than the current rules. The guidance in the Regulatory Flexibility Act is that we should adopt rules that are flexible, that fit in with how businesses actually conduct operations, and that are sensitive to the concerns of small businesses. Clearly the RSAC process does this. Had we adopted the suggestions of labor organizations objecting to the proposed rule in the full RSAC and in their comments to the docket, then we would have produced a rule with greater benefits and greater costs, which the FRA believes would have substantially lower net benefits than the proposed rule or this final rule.

Estimated Benefit of Changes to the Track Standards

In 1995, there were 827 reported train accidents from track-related causes, which caused about $62 million in damage to railroad property. These accidents also caused 17 injuries and the evacuation of approximately 1,000 people. *See* Tables 22, 65, and 27, Accident/Incident Bulletin 164, Calendar Year 1995, FRA 1996. If each accident resulted in $20,000 in miscellaneous costs, such as rerailing trains, providing emergency response, and legal costs, then the total miscellaneous cost would have been about $16 million.[1] If each injury cost $10,000, then the total injury cost would be about $170,000.[2] If each evacuation cost $1,000, then the total evacuation cost would have been about $1 million.[3] These costs are further documented in FRA's economic analysis, available in the public docket. The total for all of these costs would have been about $80 million.

The FRA believes it is conservative to estimate that these costs will be reduced by five percent, as the revision addresses virtually every accident cause found in the bulletin. That would provide an estimated benefit of about $4 million per year, or about $40 million in net present value over 20 years. This value may be significantly higher, as the average cost of accidents in certain categories targeted in the rule tends to be above average. For instance, broken rail derailments on main lines (internal rail flaw detection provisions) and accidents caused by buckled track (CWR provisions) tend to be higher-speed accidents with large railroad damage totals and greater potential for third-party impacts, such as evacuations and disruptions in adjacent transportation corridors.

Using reasonably conservative assumptions, it appears that the net burden on railroads will be less than $2 million per year, a very small number when compared to total rail revenues ($37.6 billion in 1995 for Class 1 railroads only). Railroads will receive a benefit in the form of greater certainty over the future of track safety standards as a result of their active participation in the RSAC process which provided the framework for the revised rule. They will also receive some benefit where existing provisions have been made less stringent.

It is not clear whether that benefit exceeds the burden, although it appears from the willingness of railroads to consent to the Track Working Group proposal that they would receive a net benefit. Of course, the railroads would be even better off if the provisions which burden them were removed and those which benefit them remained. Other members of the Track Working Group did not accept that proposal. In their comments, railroads agreed that they would rather have FRA implement the proposed rule as a whole than continue with the current standards, although they would prefer that the proposed rule changed certain provisions.

Federalism Implications

This final rule has been analyzed according to the principles of Executive Order 12612 (''Federalism''). It has been determined that these amendments to Part 213 do not have federalism implications. As noted previously, the U.S. Supreme Court, in *CSX* v. *Easterwood*, upheld Federal preemption of any state or local attempts to regulate train speed. Nothing in this notice proposes to change that relationship. Likewise, the addition to Part 213's requirement for vegetation maintenance near grade crossings is not intended to preempt any similar existing state or local requirements. The provisions that require railroads seeking to operate in Classes 8 and 9 to have a program addressing vandalism and trespassing are directed only to the railroads, and not to state or local governments. If a railroad is unable to provide an adequate program to address these issues, it will not be allowed to operate at Classes 8 and 9 speeds. For these reasons, the preparation of a Federalism Assessment is not warranted.

[1] Internal FRA estimates show that it would cost about $2,000 to rerail a single car, and that it costs about $10,000, conservatively, for an emergency response to a small derailment, and about $8,000 for about 80 hours of legal time at $100 per hour, which is also conservative as a measure of the resources used in response to a derailment.

[2] Based on an injury between AIS 1, minor, and AIS 2, moderate, on the Accidental Injury Severity scale, the society would be willing to pay between $5,400 and $41,850 to avoid the injury.

[3] Based on about $200 to relocate, house and feed an evacuee for one night, plus other costs to society, such as business, school and road closures, which come to about four times the individual evacuation cost.

Regulatory Flexibility Act

This notice contains a summary of a regulatory flexibility analysis (RFA) as required by the provisions of the Regulatory Flexibility Act at 5 U.S.C. 601–612. FRA completed a RFA as part of an economic analysis of costs and benefits, and placed of copy of the RFA in the docket for this proceeding.

1. Why action by the agency is being considered:

The Rail Safety Enforcement and Review Act of 1992, Public Law 102–365, 106 Stat. 972 (September 3, 1992), later amended by the Federal Railroad Safety Authorization Act of 1994, Public Law 103–440, 108 Stat. 4615 (November 2, 1994), requires FRA to revise the track safety regulations contained in 49 CFR Part 213. Now codified at 49 U.S.C. § 20142, the amended statute requires:

(a) Review of Existing Regulations.—Not later than March 3, 1993, the Secretary of Transportation shall begin a review of Department of Transportation regulations related to track safety standards. The review at least shall include an evaluation of—

(1) Procedures associated with maintaining and installing continuous welded rail and its attendant structure, including cold weather installation procedures;

(2) The need for revisions to regulations on track excepted from track safety standards; and

(3) Employee safety.

(b) Revision of Regulations.—Not later than September 1, 1995, the Secretary shall prescribe regulations and issue orders to revise track safety standards, considering safety information presented during the review under subsection (a) of this section and the report of the Comptroller General submitted under subsection ''(c)'' of this section.

* * * * *

(d) Identification of Internal Rail Defects.—In carrying out subsections (a) and (b), the Secretary shall consider whether or not to prescribe regulations and issue orders concerning—

(1) Inspection procedures to identify internal rail defects, before they reach imminent failure size, in rail that has significant shelling; and

(2) Any specific actions that should be taken when a rail surface condition, such as shelling, prevents the identification of internal defects.

The reasons for the actual provisions of the action considered by the agency are explained in the body of the analysis.

2. The objectives and legal basis for the rule:

The objective of the rule is to enhance the safety of rail transportation, protecting both those traveling and working on the system, and those off the system who might be adversely affected by a rail incident. The legal basis is reflected in the response to ''1.'' above and in the preamble.

3. A description of and an estimate of the number of small entities to which the rule would apply:

The rule would apply to railroads. Small entities among affected railroads would all be short line railroads. There are approximately 700 short line railroads in the United Sates, but many of them are not small entities, either because they are large enterprises as railroads, or because they are operations of large entities in other industries.

4. A description of the projected reporting, recordkeeping and other compliance requirements of the rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for preparation of the report or record:

See the Paperwork Reduction Act analysis.

5. Federal rules which may duplicate, overlap, or conflict with the rule:

None.

Significant Alternatives

In their comments to the NPRM, labor organizations suggested certain enhancements. However, the FRA does not believe that their suggestions would have made the rule more flexible; rather, they would have increased the burden on small entities significantly with relatively little commensurate benefit.

1. Differing compliance or reporting requirements or timetables which take into account the resources available to small entities:

In the two sections most likely to affect small entities, § 213.4 Excepted Track and § 213.109 Crossties, the final rule includes a two year phase-in period.

2. Clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities:

Although their needs were considered at every step of the process, there was no way to reduce the burden on small entities that did not apply as well to larger entities.

3. Use of performance, rather than design standards:

Where possible, especially in the geometry standards, the standards were tied to performance. Although they were expressed as specifications, the underlying performance model ensures that they will have the same effect as a performance standard would. In the high speed standards, vehicle qualification is expressed strictly as a performance standard.

4. Exemption from coverage of the rule, or any part thereof, for such small entities:

There was no practicable way to exclude small entities. Further, the low volume operations of the largest railroads often serve shippers which are small entities, and any additional burden on the low volume lines of large railroads would likely have adverse impacts on those small shippers.

Definition of Small Entity

SBREFA incorporates the definition for ''small entity'' that is established by existing law (5 U.S.C. 601, 15 U.S.C. 632, 13 CFR Part 121) for those businesses to be covered by agency policies. Generally, a small entity is a business concern that is independently owned and operated, and is not dominant in its field of operation. Also, ''small governmental jurisdictions'' that serve populations of 50,000 or less are small entities. (Commuter railroads are governmental jurisdictions, and some may fit within this statutory delineation for small governmental jurisdictions, or small entities.) An agency may establish one or more other definitions for this term, in consultation with the SBA and after opportunity for public comment, that are appropriate to the agency's activities.

Pursuant to its statutory authority, the Small Business Administration (SBA) promulgated regulations that clarify the term ''small entity'' by industry, using number of employees or annual income as criteria. *See* 13 CFR 121.101–108 and 201. In the SBA regulations, main line railroads with 1,500 or fewer employees, and switching or terminal establishments with 500 or fewer employees constitute small entities. The SBA regulations do not address hazardous material shippers in the railroad industry.

Prior to the SBA regulations establishing size categories, the Interstate Commerce Commission (ICC) developed a classification system for freight railroads as Class I, II, or III, based on annual operating revenue. (The detailed, qualifying criteria for these classifications are set forth in 49 CFR part 1201.) The Department of Transportation's Surface Transportation Board, which succeeded the ICC, has not changed these classifications. The ICC classification system has been used pervasively by FRA and the railroad industry to identify entities by size. The SBA recognized this classification system as a sound one, and concurs with FRA's decision to continue using it, provided the public has notice of the classification system in use for any particular proceeding and an opportunity to comment on it.

As explained in detail in the ''Interim Policy Statement Concerning Small

Entities Subject to the Railroad Safety Laws,'' published August 11, 1997 at 62 Fed. Reg. 43024, FRA has decided to define ''small entity,'' on an interim basis, to include only those entities whose revenues would bring them within the Class III definition. This definition is the basis of the small business analysis for this proceeding.

Effect of This Rule on Small Businesses

All of the small entities directly affected by this rule are short line railroads. They are represented by the ASLRA who participated in the Track Working Group. The ASLRA was not, of course, involved in developing those standards which would not apply to any of their members, for example, the high speed track standards. The ASLRA supported the NPRM as drafted by the Track Working Group and recommended by the RSAC. All of the individual short line railroads that participated directly in the Track Working Group agreed to the proposal as well. In addition, the ASLRA and several short line railroads participated in all of the workshops hosted by FRA in 1993 following the publication of the ANPRM in this proceeding.

Almost every change in this final rule will enhance safety. Some provisions serve to reduce burdens, but in most cases, the burden is increased, particularly for the railroads. However, the Track Working Group considered the impact on small entities at every step, and introduced phase-in periods to mitigate the effect on small entities by the crosstie standard and the new gage standard for excepted track. While there is no clear way to measure the net effect of the final rule, it is likely the net benefit will be positive. The RSAC process was intended to take rulemaking into areas where data is sparse, and the end product, as might be expected, is difficult to quantify.

FRA did not quantify the estimated annual cost to the average firm, nor compare it to average annual revenue or profits, because the relative impact of the final rule varies more by condition of the track owned by a railroad than by the size of the railroad. Railroads with better, safer track will face proportionally much smaller effects from the final rule. The average annual total cost is likely to be less than $2 million per year for the entire railroad industry, with more than half of the cost borne by large railroads. The average burden per small railroad is likely therefore to be less than $1,500 per year. The burden will be greater on railroads with more track, and lower on railroads with less.

No provision included in this final rule will have a very adverse impact on the affected firms. A proposal which would have a large beneficial impact is the GRMS as an alternative to the crosstie standard. (*See* previous discussion in the preamble to this notice.) Some provisions which at first impression seem to have a significant impact, such as an increase in the number of required crossties, in fact will have little impact.

For example, this final rule includes an increase in the number of crossties required on curved track. In a worst case, about 30 percent of the Class 1 track of a very small entity might not comply with the requirement for six ties per 39-foot section of rail. Of this, 80 percent would not comply with geometry standards or standards affecting effective distribution of ties, which likely would be fixed by adding enough ties comply or exceed the standard. The remaining track, about six percent of all track, would not have sufficient ties to meet the revised standard. Some of this track would not meet the current standard. One tie per section for six percent of the track would be slightly more than eight ties per mile. At a cost of $40 per tie installed, this would mean a cost of about $320 per mile, for a worst case. A railroad with track this poor would have presented a serious safety hazard in the first place, and would not be representative. Most small railroads currently exceed the revised standard. A more detailed description of the impact is contained in the complete IRFA, found in the docket for this proceeding.

Throughout the discussions of the Track Working Group, and in the NPRM for this proceeding, FRA asked for additional information on benefits and costs. On occasion, participants shared such data with FRA. For example, the ASLRA which conducted a survey of its members to analyze the potential impact of increasing the number of crossties required in a 39-foot segment of track. At other times, data were not shared with FRA, and the agency was unable to determine whether the information was withheld for proprietary reasons or whether it simply was not available. However, by voting in the Track Working Group and in the RSAC to accept a provision in the proposed rule, often as part of a compromise with other interested parties, the parties' acceptance of a package of compromises revealed that they preferred the compromise position to a position of no compromise (the existing rule with the possibility of some other rulemaking activity). This implies that the burdens which rail management representatives accepted likely were not significant. Details of provisions that will have little or no impact may be found in the complete IRFA, found in the docket for this proceeding.

Paperwork Reduction Act

The information collection requirements in this final rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 *et seq.* The FRA has analyzed the existing burden, and the burden under the final rule analyzed here. According to this analysis, the total annual burden increases from about $42,000,000 to about $53,000,000. However, the overwhelming majority of this apparent increase is due to a change in FRA's assumption regarding wages. In an earlier analysis under the Paperwork Reduction Act, the FRA had assumed a wage of $22 per hour for recording track inspections, but in the analysis of this final rule, the FRA used an assumed wage of $30 per hour. In addition, the number of railroads calculated by FRA to be covered by the regulations increased from 500 to 680. The sections that contain the new information collection requirements and the estimated time to fulfill each requirement are as follows:

CFR section	Respondent universe	Total annual responses	Average time per response	Total annual burden hours	Total annual burden cost
213.4—Excepted Track:					
—Designation of track as excepted	160 railroads	32 designations	15 minutes	8 hours	$240
—Notification to FRA about removal of excepted track.	160 railroads	40 notifications	10 minutes	7 hours	210
213.5—Responsibility of track owners	620 railroads	16 notifications	8 hours	120 hours	3,600
213.7—Designation of qualified persons to supervise certain renewals and inspect track:					

CFR section	Respondent universe	Total annual responses	Average time per response	Total annual burden hours	Total annual burden cost
—Designations (fully qualified)	620 railroads	1,500 names	10 minutes	250 hours	7,500
—Designations (partially qualified)	31 railroads	300 names	10 minutes	50 hours	1,500
—Notification and dispatched to location.	N/A	N/A	Usual and customary procedure.	N/A	N/A
213.17—Waivers	620 railroads	4 petitions	24 hours	96 hours	2,880
213.57—Curves, elevation and speed limitations:					
—Request to FRA for approval	620 railroads	3 requests	40 hours	120 hours	3,600
—Notification to FRA with written consent of other affected track owners.	620 railroads	2 notifications	45 minutes	1.5 hours	45
—Test plan	1 railroad	6 plans	16 hours	96 hours	2,880
213.119—Continuous welded rail (CWR), general:					
—Written procedures	110 railroads	110 procedures	40 hrs. Class I RRs	2,000 hours	60,000
—Training program	110 railroads	110 programs	16 hrs. Class II RRs	1,200 hours	36,000
—Recordkeeping	110 railroads	4,500 records	40 hrs Class I RRs 8 hrs Class II RRs 10 minutes	750 hours	22,500
213.122—Torch cut rail	20 railroads	2,000 records	5 minutes	167 hours	5,010
213.233—Track inspections	620 railroads	2,500 inspections	1 minute	41.5 hours	1,079
213.237—Inspection of rail	N/A	N/A	Usual and customary procedure.	N/A	N/A
213.241—Inspection records	620 railroads	Varies	Varies	1,763,991 hours	52,919,730
213.303—Responsibility for Compliance	2 railroads	1 petition	8 hours	8 hours	240
213.305—Designation of qualified individuals; general qualifications:					
—Designations (fully qualified)	2 railroads	150 qualifications	10 minutes	25 hours	750
—Designations (partially qualified)	2 railroads	15 qualifications	10 minutes	2.5 hours	75
213.317—Waivers	2 railroads	1 petition	24 hours	24 hours	720
213.329—Curves, elevation and speed limitations:					
—FRA approval of qualified equipment and higher curving speeds.	2 railroads	1 notification	40 hours	40 hours	1,200
—Written notification to FRA with written consent of other affected track owners.	2 railroads	1 notification	45 minutes	45 minutes	22.50
213.333—Automated Vehicle Inspection System					
—Track Geometry Measurement System.	3 railroads	18 reports	20 hours	360 hours	9,360
—Track/Vehicle Performance Measurement System.					
—Written procedures	1 railroad	1 program	8 hours	8 hours	240
—Copies of most recent exception printouts.	2 railroads	13 printouts	20 hours	260 hours	7,800
213.339—Inspection of rail in service	N/A	N/A	Usual and customary procedure.	N/A	N/A
213.341—Initial inspection of new rail and welds					
—Mill inspection	2 railroads	1 report	8 hours	8 hours	240
—Welding plant inspection	2 railroads	2 reports	8 hours	16 hours	480
—Inspection of field welds	2 railroads	200 records	20 minutes	67 hours	2,010
—Marking of defective rail	N/A	N/A	Usual and customary procedure.	N/A	N/A
213.343—Continuous welded rail (CWR):					
—Written procedures	2 railroads	2 procedures	40 hours	80 hours	2,400
—Training program	2 railroads	2 programs	40 hours	80 hours	2,400
—Recordkeeping	2 railroads	200 records	10 minutes	33 hours	990
213.345—Vehicle qualification testing	1 railroad	1 report	16 hours	16 hours	480
213.347—Automotive or railroad crossings at grade					
—Protection plans	1 railroad	2 plans	8 hours	16 hours	480
213.353—Turnouts and crossovers, generally.	1 railroad	1 guidebook	40 hours	40 hours	1,200
213.361—Right of Way	1 railroad	1 plan	40 hours	40 hours	1,200
213.369—Inspection records:					
—Record of inspection	2 railroads	500 records	1 minute	8 hours	208
—Designation of location where record should be maintained.	2 railroads	2 designations	15 minutes	30 minutes	15

CFR section	Respondent universe	Total annual responses	Average time per response	Total annual burden hours	Total annual burden cost
—Internal defect inspections and remedial action taken.	2 railroads	50 records	5 minutes	4 hours	104

All estimates include the time for reviewing instructions; searching existing data sources; gathering or maintaining the needed data; and reviewing the information. For information or a copy of the paperwork package submitted to OMB contact Mark Weihofen at 202–632–3303.

FRA cannot impose a penalty on persons for violating information collection requirements which do not display a current OMB control number, if required. The information collection requirements contained in this rule have been approved under OMB control number 2130–0010.

Environmental Impact

FRA has evaluated these track safety regulations in accordance with its procedures for ensuring full consideration of the potential environmental impacts of FRA actions, as required by the National Environmental Policy Act (42 U.S.C. 4321, *et seq.*) and related directives. These regulations and this statement of policy meet the criteria that establish this as a non-major action for environmental purposes.

List of Subjects in 49 CFR Part 213

Penalties, Railroad safety, Reporting and recordkeeping requirements.

The Final Rule

In consideration of the foregoing, FRA revises part 213, title 49, Code of Federal Regulations as follows:

PART 213—TRACK SAFETY STANDARDS

Subpart A—General

Sec.

Subpart B—Roadbed

Subpart C—Track Geometry

Subpart D—Track Structure

Subpart E—Track Appliances and Track-Related Devices

Subpart F—Inspection

Subpart G—Train Operations at Track Classes 6 and Higher

Authority: 49 U.S.C. 20102–20114 and 20142; 28 U.S.C. 2461; and 49 CFR 1.49(m).

Subpart A—General

§ 213.1 Scope of part.

(a) This part prescribes minimum safety requirements for railroad track that is part of the general railroad system of transportation. The requirements prescribed in this part apply to specific track conditions existing in isolation. Therefore, a combination of track conditions, none of which individually amounts to a deviation from the requirements in this part, may require remedial action to provide for safe operations over that track. This part does not restrict a railroad from adopting and enforcing additional or more stringent requirements not inconsistent with this part.

(b) Subparts A through F apply to track Classes 1 through 5. Subpart G and 213.2, 213.3, and 213.15 apply to track over which trains are operated at speeds in excess of those permitted over Class 5 track.

§ 213.2 Preemptive effect.

Under 49 U.S.C. 20106, issuance of these regulations preempts any State law, regulation, or order covering the

same subject matter, except an additional or more stringent law, regulation, or order that is necessary to eliminate or reduce an essentially local safety hazard; is not incompatible with a law, regulation, or order of the United States Government; and that does not impose an unreasonable burden on interstate commerce.

§ 213.3 Application.

(a) Except as provided in paragraph (b) of this section, this part applies to all standard gage track in the general railroad system of transportation.

(b) This part does not apply to track—

(1) Located inside an installation which is not part of the general railroad system of transportation; or

(2) Used exclusively for rapid transit operations in an urban area that are not connected with the general railroad system of transportation.

§ 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 10¼ 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.

§ 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.

§ 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.

§ 213.9 Classes of track: operating speed limits.

(a) Except as provided in paragraph (b) of this section and §§ 213.57(b), 213.59(a), 213.113(a), and 213.137(b) and (c), the following maximum allowable operating speeds apply—

[In miles per hour]

Over track that meets all of the requirements prescribed in this part for—	The maximum allowable operating speed for freight trains is—	The maximum allowable operating speed for passenger trains is—
Excepted track	10	N/A
Class 1 track	10	15
Class 2 track	25	30
Class 3 track	40	60
Class 4 track	60	80
Class 5 track	80	90

(b) If a segment of track does not meet all of the requirements for its intended class, it is reclassified to the next lowest class of track for which it does meet all of the requirements of this part. However, if the segment of track does not at least meet the requirements for Class 1 track, operations may continue at Class 1 speeds for a period of not more than 30 days without bringing the track into compliance, under the authority of a person designated under § 213.7(a), who has at least one year of supervisory experience in railroad track maintenance, after that person determines that operations may safely continue and subject to any limiting conditions specified by such person.

§ 213.11 Restoration or renewal of track under traffic conditions.

If during a period of restoration or renewal, track is under traffic conditions and does not meet all of the requirements prescribed in this part, the work on the track shall be under the continuous supervision of a person designated under § 213.7(a) who has at least one year of supervisory experience in railroad track maintenance, and subject to any limiting conditions specified by such person. The term ''continuous supervision'' as used in this section means the physical presence of that person at a job site. However, since the work may be performed over a large area, it is not necessary that each phase of the work be done under the visual supervision of that person.

§ 213.13 Measuring track not under load.

When unloaded track is measured to determine compliance with requirements of this part, the amount of rail movement, if any, that occurs while the track is loaded must be added to the measurements of the unloaded track.

§ 213.15 Penalties.

(a) Any person who violates any requirement of this part or causes the violation of any such requirement is subject to a civil penalty of at least $500 and not more than $11,000 per violation, except that: Penalties may be assessed against individuals only for willful violations, and, where a grossly negligent violation or a pattern of repeated violations has created an imminent hazard of death or injury to persons, or has caused death or injury, a penalty not to exceed $22,000 per violation may be assessed. ''Person'' means an entity of any type covered under 1 U.S.C. 1, including but not limited to the following: a railroad; a manager, supervisor, official, or other employee or agent of a railroad; any owner, manufacturer, lessor, or lessee of railroad equipment, track, or facilities; any independent contractor providing goods or services to a railroad; any employee of such owner, manufacturer, lessor, lessee, or independent contractor; and anyone held by the Federal Railroad Administrator to be responsible under § 213.5(d) or § 213.303(c). Each day a violation continues shall constitute a separate offense. See appendix B to this part for a statement of agency civil penalty policy.

(b) Any person who knowingly and willfully falsifies a record or report required by this part may be subject to criminal penalties under 49 U.S.C. 21311.

§ 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.

213.19 Information collection.

(a) The information collection requirements of this part were reviewed by the Office of Management and Budget pursuant to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*) and are assigned OMB control number 2130–0010.

(b) The information collection requirements are found in the following sections: §§ 213.4, 213.5, 213.7, 213.17, 213.57, 213.119, 213.122, 213.233, 213.237, 213.241, 213.303, 213.305, 213.317, 213.329, 213.333, 213.339, 213.341, 213.343, 213.345, 213.353, 213.361, 213.369.

Subpart B—Roadbed

§ 213.31 Scope.

This subpart prescribes minimum requirements for roadbed and areas immediately adjacent to roadbed.

§ 213.33 Drainage.

Each drainage or other water carrying facility under or immediately adjacent to the roadbed shall be maintained and kept free of obstruction, to accommodate expected water flow for the area concerned.

§ 213.37 Vegetation.

Vegetation on railroad property which is on or immediately adjacent to roadbed shall be controlled so that it does not—

(a) Become a fire hazard to track-carrying structures;

(b) Obstruct visibility of railroad signs and signals:

(1) Along the right-of-way, and

(2) At highway-rail crossings; (This paragraph (b)(2) is applicable September 21, 1999.)

(c) Interfere with railroad employees performing normal trackside duties;

(d) Prevent proper functioning of signal and communication lines; or

(e) Prevent railroad employees from visually inspecting moving equipment from their normal duty stations.

Subpart C—Track Geometry

§ 213.51 Scope.

This subpart prescribes requirements for the gage, alinement, and surface of track, and the elevation of outer rails and speed limitations for curved track.

§ 213.53 Gage.

(a) Gage is measured between the heads of the rails at right-angles to the rails in a plane five-eighths of an inch below the top of the rail head.

(b) Gage shall be within the limits prescribed in the following table—

Class of track	The gage must be at least—	But not more than—
Excepted track	N/A	4′10¼″.
Class 1 track	4′8″	4′10″.
Class 2 and 3 track	4′8″	4′9¾″.
Class 4 and 5 track	4′8″	4′9½″.

§ 213.55 Alinement.

Alinement may not deviate from uniformity more than the amount prescribed in the following table:

Class of track	Tangent track	Curved track	
	The deviation of the mid-offset from a 62-foot line[1] may not be more than— (inches)	The deviation of the mid-ordinate from a 31-foot chord[2] may not be more than— (inches)	The deviation of the mid-ordinate from a 62-foot chord[2] may not be more than— (inches)
Class 1 track	5	[3] N/A	5
Class 2 track	3	[3] N/A	3
Class 3 track	1¾	1¼	1¾
Class 4 track	1½	1	1½
Class 5 track	¾	½	⅝

[1] The ends of the line shall be at points on the gage side of the line rail, five-eighths of an inch below the top of the railhead. Either rail may be used as the line rail, however, the same rail shall be used for the full length of that tangential segment of track.

[2] The ends of the chord shall be at points on the gage side of the outer rail, five-eighths of an inch below the top of the railhead.

[3] N/A—Not Applicable.

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

$$V_{max} = \sqrt{\frac{E_a + 3}{0.0007D}}$$

Where—

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

E_a = Actual elevation of the outside rail (inches).[1]

D = Degree of curvature (degrees).[2]

(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—

[1] Actual elevation for each 155 foot track segment in the body of the curve is determined by averaging the elevation for 10 points through the segment at 15.5 foot spacing. If the curve length is less than 155 feet, average the points through the full length of the body of the curve .

[2] Degree of curvature is determined by averaging the degree of curvature over the same track segment as the elevation.

$$V_{max} = \sqrt{\frac{E_a + 4}{0.0007D}}$$

Where—

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

E_a = Actual elevation of the outside rail (inches).[1]

D = Degree of curvature (degrees).[2]

(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 [3] 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 days 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.

§ 213.59 Elevation of curved track; runoff.

(a) If a curve is elevated, the full elevation shall be provided throughout the curve, unless physical conditions do not permit. If elevation runoff occurs in a curve, the actual minimum elevation shall be used in computing the maximum allowable operating speed for that curve under § 213.57(b).

(b) Elevation runoff shall be at a uniform rate, within the limits of track surface deviation prescribed in § 213.63, and it shall extend at least the full length of the spirals. If physical conditions do not permit a spiral long enough to accommodate the minimum length of runoff, part of the runoff may be on tangent track.

§ 213.63 Track surface.

Each owner of the track to which this part applies shall maintain the surface of its track within the limits prescribed in the following table:

Track surface	Class of track				
	1 (inches)	2 (inches)	3 (inches)	4 (inches)	5 (inches)
The runoff in any 31 feet of rail at the end of a raise may not be more than.	3½	3	2	1½	1
The deviation from uniform profile on either rail at the mid-ordinate of a 62-foot chord may not be more than	3	2¾	2¼	2	1¼

[3] The test procedure may be conducted in a test facility whereby all the wheels on one side (right or left) of the equipment are alternately raised and lowered by 4 and 6 inches and the vertical wheel loads under each wheel are measured and a level is used to record the angle through which the floor of the equipment has been rotated.

Track surface	Class of track				
	1 (inches)	2 (inches)	3 (inches)	4 (inches)	5 (inches)
The deviation from zero crosslevel at any point on tangent or reverse crosslevel elevation on curves may not be more than	3	2	1¾	1¼	1
The difference in crosslevel between any two points less than 62 feet apart may not be more than*[1, 2]	3	2¼	2	1¾	1½
*Where determined by engineering decision prior to the promulgation of this rule, due to physical restrictions on spiral length and operating practices and experience, the variation in crosslevel on spirals per 31 feet may not be more than	2	1¾	1¼	1	¾

[1] Except as limited by § 213.57(a), where the elevation at any point in a curve equals or exceeds 6 inches, the difference in crosslevel within 62 feet between that point and a point with greater elevation may not be more than 1½ inches. (Footnote 1 is applicable December 21, 1999.)

[2] However, to control harmonics on Class 2 through 5 jointed track with staggered joints, the crosslevel differences shall not exceed 1¼ inches in all of six consecutive pairs of joints, as created by 7 low joints. Track with joints staggered less than 10 feet shall not be considered as having staggered joints. Joints within the 7 low joints outside of the regular joint spacing shall not be considered as joints for purposes of this footnote. (Footnote 2 is applicable September 21, 1999.)

Subpart D—Track Structure

§ 213.101 Scope.

This subpart prescribes minimum requirements for ballast, crossties, track assembly fittings, and the physical conditions of rails.

§ 213.103 Ballast; general.

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

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

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

(c) Provide adequate drainage for the track; and

(d) Maintain proper track crosslevel, surface, and alinement.

§ 213.109 Crossties.

(a) Crossties shall be made of a material to which rail can be securely fastened.

(b) Each 39 foot segment of track shall have—

(1) A sufficient number of crossties which in combination provide effective support that will—

(i) Hold gage within the limits prescribed in § 213.53(b);

(ii) Maintain surface within the limits prescribed in § 213.63; and

(iii) Maintain alinement within the limits prescribed in § 213.55.

(2) The minimum number and type of crossties specified in paragraphs (c) and (d) of this section effectively distributed to support the entire segment; and

(3) At least one crosstie of the type specified in paragraphs (c) and (d) of this section that is located at a joint location as specified in paragraph (f) of this section.

(c) Each 39 foot segment of: Class 1 track shall have five crossties; Classes 2 and 3 track shall have eight crossties; and Classes 4 and 5 track shall have 12 crossties, which are not:

(1) Broken through;

(2) Split or otherwise impaired to the extent the crossties will allow the ballast to work through, or will not hold spikes or rail fasteners;

(3) So deteriorated that the tie plate or base of rail can move laterally more than ½ inch relative to the crossties; or

(4) Cut by the tie plate through more than 40 percent of a ties' thickness.

(d) Each 39 foot segment of track shall have the minimum number and type of crossties as indicated in the following table (this paragraph (d) is applicable September 21, 2000)

Class of track	Tangent track and curves ≤2 degrees	Turnouts and curved track over 2 degrees
Class 1 track	5	6
Class 2 track	8	9
Class 3 track	8	10
Class 4 and 5 track	12	14

(e) Crossties counted to satisfy the requirements set forth in the table in paragraph (d) of this section shall not be—

(1) Broken through;

(2) Split or otherwise impaired to the extent the crossties will allow the ballast to work through, or will not hold spikes or rail fasteners;

(3) So deteriorated that the tie plate or base of rail can move laterally ½ inch relative to the crossties; or

(4) Cut by the tie plate through more than 40 percent of a crosstie's thickness this paragraph (e) is applicable September 21, 2000.

(f) Class 1 and Class 2 track shall have one crosstie whose centerline is within 24 inches of each rail joint location, and Classes 3 through 5 track shall have one crosstie whose centerline is within 18 inches of each rail joint location or, two crossties whose centerlines are within 24 inches either side of each rail joint location. The relative position of these ties is described in the following diagrams:

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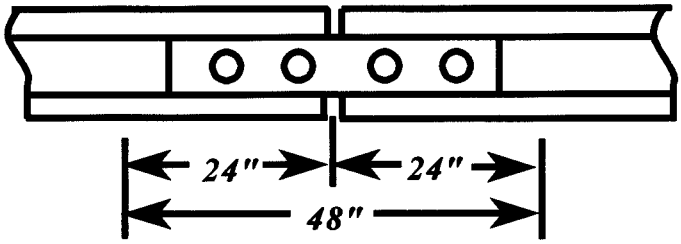
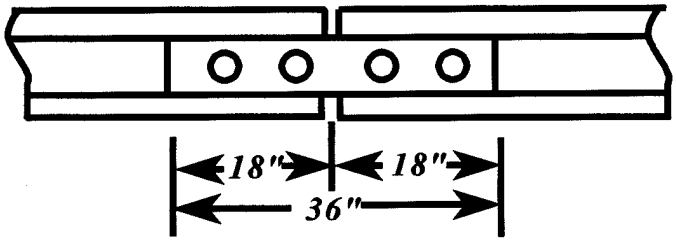
Classes 1 and 2

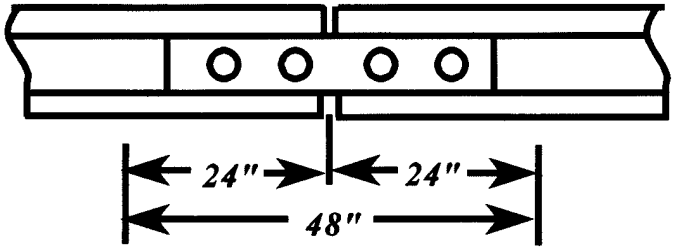


Each rail joins in Classes 1 and 2 track shall be supported by at least one crosstie specified in paragraphs (c) and (d) of this section whose centerline is within 48″ shown above.

Classes 3 through 5



Each rail joins in Classes 3 through 5 track shall be supported by either at least one crosstie specified in paragraphs (c) and (d) of this section whose centerline is within 36″ shown above, or:



Two crossties, one on each side of the rail joint, whose centerlines are within 24″ of the rail joint location shown above.

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(g) For track constructed without crossties, such as slab track, track connected directly to bridge structural components and track over servicing pits, the track structure shall meet the requirements of paragraphs (b)(1)(i), (ii), and (iii) of this section.

§ 213.113 Defective rails.

(a) When an owner of track to which this part applies learns, through inspection or otherwise, that a rail in that track contains any of the defects listed in the following table, a person designated under § 213.7 shall determine whether or not the track may continue in use. If he determines that the track may continue in use, operation over the defective rail is not permitted until—

(1) The rail is replaced; or

(2) The remedial action prescribed in the table is initiated.

Defect	Length of defect (inch)		Percent of rail head cross-sectional area weakened by defect		If defective rail is not replaced, take the remedial action prescribed in note
	More than	But not more than	Less than	But not less than	
Transverse fissure			70	5	B.
			100	70	A2.
				100	A.
Compound fissure			70	5	B.
			100	70	A2.
				100	A.
Detail fracture			25	5	C.
Engine burn fracture			80	25	D.

Defect	Length of defect (inch)		Percent of rail head cross-sectional area weakened by defect		If defective rail is not replaced, take the remedial action prescribed in note
	More than	But not more than	Less than	But not less than	
Defective weld			100	80	[A2] or [E and H].
				100	[A] or [E and H].
Horizontal split head	1	2			H and F.
Vertical split head	2	4			I and G.
Split web	4				B.
Piped rail	(1)	(1)	(1)		A.
Head web separation					
	½	1			H and F.
Bolt hole crack	1	1½			H and G.
	1½				B.
	(1)	(1)	(1)		A.
Broken base	1	6			D.
	6				[A] or [E and I].
Ordinary break					A or E.
Damaged rail					D.
Flattened rail	Depth ≥ ⅜ and Length ≥ 8.				H.

[1] Break out in rail head.

Notes

A. Assign person designated under § 213.7 to visually supervise each operation over defective rail.

A2. Assign person designated under § 213.7 to make visual inspection. After a visual inspection, that person may authorize operation to continue without continuous visual supervision at a maximum of 10 m.p.h. for up to 24 hours prior to another such visual inspection or replacement or repair of the rail.

B. Limit operating speed over defective rail to that as authorized by a person designated under § 213.7(a), who has at least one year of supervisory experience in railroad track maintenance. The operating speed cannot be over 30 m.p.h. or the maximum allowable speed under § 213.9 for the class of track concerned, whichever is lower.

C. Apply joint bars bolted only through the outermost holes to defect within 20 days after it is determined to continue the track in use. In the case of Classes 3 through 5 track, limit operating speed over defective rail to 30 m.p.h. until joint bars are applied; thereafter, limit speed to 50 m.p.h. or the maximum allowable speed under § 213.9 for the class of track concerned, whichever is lower. When a search for internal rail defects is conducted under § 213.237, and defects are discovered in Classes 3 through 5 which require remedial action C, the operating speed shall be limited to 50 m.p.h., or the maximum allowable speed under § 213.9 for the class of track concerned, whichever is lower, for a period not to exceed 4 days. If the defective rail has not been removed from the track or a permanent repair made within 4 days of the discovery, limit operating speed over the defective rail to 30 m.p.h. until joint bars are applied; thereafter, limit speed to 50 m.p.h. or the maximum allowable speed under § 213.9 for the class of track concerned, whichever is lower.

D. Apply joint bars bolted only through the outermost holes to defect within 10 days after it is determined to continue the track in use. In the case of Classes 3 through 5 track, limit operating speed over the defective rail to 30 m.p.h. or less as authorized by a person designated under § 213.7(a), who has at least one year of supervisory experience in railroad track maintenance, until joint bars are applied; thereafter, limit speed to 50 m.p.h. or the maximum allowable speed under § 213.9 for the class of track concerned, whichever is lower.

E. Apply joint bars to defect and bolt in accordance with § 213.121(d) and (e).

F. Inspect rail 90 days after it is determined to continue the track in use.

G. Inspect rail 30 days after it is determined to continue the track in use.

H. Limit operating speed over defective rail to 50 m.p.h. or the maximum allowable speed under § 213.9 for the class of track concerned, whichever is lower.

I. Limit operating speed over defective rail to 30 m.p.h. or the maximum allowable speed under § 213.9 for the class of track concerned, whichever is lower.

(b) As used in this section—

(1) *Transverse fissure* means a progressive crosswise fracture starting from a crystalline center or nucleus inside the head from which it spreads outward as a smooth, bright, or dark, round or oval surface substantially at a right angle to the length of the rail. The distinguishing features of a transverse fissure from other types of fractures or defects are the crystalline center or nucleus and the nearly smooth surface of the development which surrounds it.

(2) *Compound fissure* means a progressive fracture originating in a horizontal split head which turns up or down in the head of the rail as a smooth, bright, or dark surface progressing until substantially at a right angle to the length of the rail. Compound fissures require examination of both faces of the fracture to locate the horizontal split head from which they originate.

(3) *Horizontal split head* means a horizontal progressive defect originating inside of the rail head, usually one-quarter inch or more below the running surface and progressing horizontally in all directions, and generally accompanied by a flat spot on the running surface. The defect appears as a crack lengthwise of the rail when it reaches the side of the rail head.

(4) *Vertical split head* means a vertical split through or near the middle of the head, and extending into or through it. A crack or rust streak may show under the head close to the web or pieces may be split off the side of the head.

(5) *Split web* means a lengthwise crack along the side of the web and extending into or through it.

(6) *Piped rail* means a vertical split in a rail, usually in the web, due to failure of the shrinkage cavity in the ingot to unite in rolling.

(7) *Broken base* means any break in the base of the rail.

(8) *Detail fracture* means a progressive fracture originating at or near the surface of the rail head. These fractures should not be confused with transverse fissures, compound fissures, or other defects which have internal origins. Detail fractures may arise from shelly spots, head checks, or flaking.

(9) *Engine burn fracture* means a progressive fracture originating in spots where driving wheels have slipped on top of the rail head. In developing downward they frequently resemble the 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, entrainment 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.

§ 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 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 December 21, 1998. 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 alinement 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) 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 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 must 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 from the Class 1 requirements specified in § 213.55 of this part. 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.

§ 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 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.

§ 213.123 Tie plates.

(a) In Classes 3 through 5 track where timber crossties are in use there shall be tie plates under the running rails on at least eight of any 10 consecutive ties.

(b) In Classes 3 through 5 track no metal object which causes a concentrated load by solely supporting a rail shall be allowed between the base of the rail and the bearing surface of the tie plate. This paragraph (b) is applicable September 21, 1999.)

§ 213.127 Rail fastening systems.

Track shall be fastened by a system of components which effectively maintains gage within the limits prescribed in § 213.53(b). Each component of each such system shall be evaluated to determine whether gage is effectively being maintained.

§ 213.133 Turnouts and track crossings generally.

(a) In turnouts and track crossings, the fastenings shall 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.

(b) Classes 3 through 5 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. For Class 3 track, this paragraph (b) is applicable September 21, 1999.)

(c) Each flangeway at turnouts and track crossings shall be at least 1½ inches wide.

§ 213.135 Switches.

(a) Each stock rail must be securely seated in switch plates, but care shall be used to avoid canting the rail by overtightening the rail braces.

(b) Each switch point shall fit its stock rail properly, with the switch stand in either of its closed positions to allow wheels to pass the switch point. Lateral and vertical movement of a stock rail in the switch plates or of a switch plate on a tie shall not adversely affect the fit of the switch point to the stock rail. Broken or cracked switch point rails will be subject to the requirements of § 213.113, except that where remedial actions C, D, or E require the use of joint bars, and joint bars cannot be placed due to the physical configuration of the switch, remedial action B will govern, taking into account any added safety provided by the presence of reinforcing bars on the switch points.

(c) Each switch shall be maintained so that the outer edge of the wheel tread cannot contact the gage side of the stock rail.

(d) The heel of each switch rail shall be secure and the bolts in each heel shall be kept tight.

(e) Each switch stand and connecting rod shall be securely fastened and operable without excessive lost motion.

(f) Each throw lever shall be maintained so that it cannot be operated with the lock or keeper in place.

(g) Each switch position indicator shall be clearly visible at all times.

(h) Unusually chipped or worn switch points shall be repaired or replaced. Metal flow shall be removed to insure proper closure.

(i) Tongue & Plain Mate switches, which by design exceed Class 1 and excepted track maximum gage limits, are permitted in Class 1 and excepted track.

§ 213.137 Frogs.

(a) The flangeway depth measured from a plane across the wheel-bearing area of a frog on Class 1 track shall not be less than 1⅜ inches, or less than 1½ inches on Classes 2 through 5 track.

(b) If a frog point is chipped, broken, or worn more than five-eighths inch down and 6 inches back, operating speed over the frog shall not be more than 10 m.p.h..

(c) If the tread portion of a frog casting is worn down more than three-eighths inch below the original contour, operating speed over that frog shall not be more than 10 m.p.h..

(d) Where frogs are designed as flange-bearing, flangeway depth may be less than that shown for Class 1 if operated at Class 1 speeds.

§ 213.139 Spring rail frogs.

(a) The outer edge of a wheel tread shall not contact the gage side of a spring wing rail.

(b) The toe of each wing rail shall be solidly tamped and fully and tightly bolted.

(c) Each frog with a bolt hole defect or head-web separation shall be replaced.

(d) Each spring shall have compression sufficient to hold the wing rail against the point rail.

(e) The clearance between the holddown housing and the horn shall not be more than one-fourth of an inch.

§ 213.141 Self-guarded frogs.

(a) The raised guard on a self-guarded frog shall not be worn more than three-eighths of an inch.

(b) If repairs are made to a self-guarded frog without removing it from service, the guarding face shall be restored before rebuilding the point.

§ 213.143 Frog guard rails and guard faces; gage.

The guard check and guard face gages in frogs shall be within the limits prescribed in the following table—

Class of track	Guard check gage The distance between the gage line of a frog to the guard line [1] of its guard rail or guarding face, measured across the track at right angles to the gage line [2], may not be less than—	Guard face gage The distance between guard lines [1], measured across the track at right angles to the gage line [2], may not be more than—
Class 1 track	4′ 6⅛″	4′ 5¼″
Class 2 track	4′ 6¼″	4′ 5⅛″
Class 3 and 4 track	4′ 6⅜″	4′ 5⅛″
Class 5 track	4′ 6½″	4′ 5″

[1] A line along that side of the flangeway which is nearer to the center of the track and at the same elevation as the gage line.

[2] A line ⅝ inch below the top of the center line of the head of the running rail, or corresponding location of the tread portion of the track structure.

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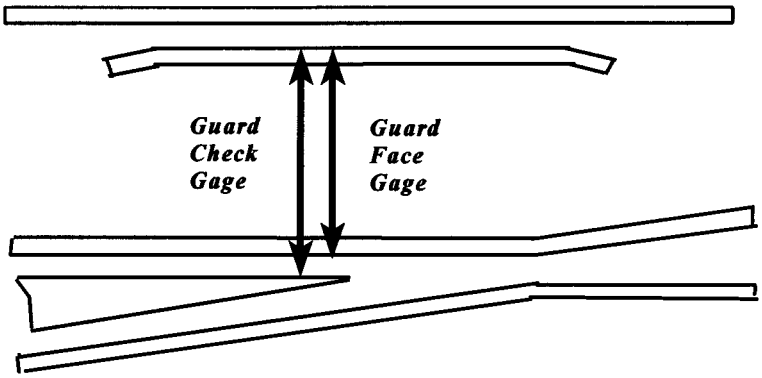

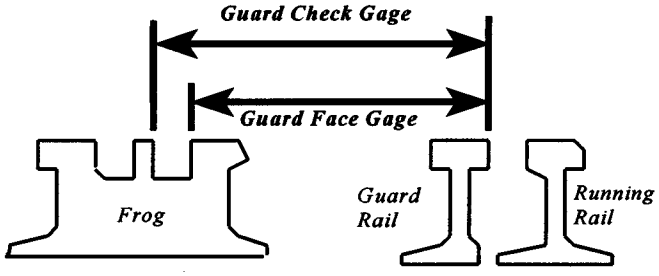

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Subpart E—Track Appliances and Track-Related Devices

§ 213.201 Scope.

This subpart prescribes minimum requirements for certain track appliances and track-related devices.

§ 213.205 Derails.

(a) Each derail shall be clearly visible.

(b) When in a locked position, a derail shall be free of lost motion which would prevent it from performing its intended function.

(c) Each derail shall be maintained to function as intended.

(d) Each derail shall be properly installed for the rail to which it is applied. (This paragraph (d) is applicable September 21, 1999.)

Subpart F—Inspection

§ 213.231 Scope.

This subpart prescribes requirements for the frequency and manner of inspecting track to detect deviations from the standards prescribed in this part.

§ 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 of track	Type of track	Required frequency
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.

§ 213.235 Inspection of switches, track crossings, and lift rail assemblies or other transition devices on moveable bridges.

(a) Except as provided in paragraph (c) of this section, each switch, turnout, track crossing, and moveable bridge lift rail assembly or other transition device shall be inspected on foot at least monthly.

(b) Each switch in Classes 3 through 5 track that is held in position only by the operating mechanism and one connecting rod shall be operated to all of its positions during one inspection in every 3 month period.

(c) In the case of track that is used less than once a month, each switch, turnout, track crossing, and moveable bridge lift rail assembly or other transition device shall be inspected on foot before it is used.

§ 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.

§ 213.239 Special inspections.

In the event of fire, flood, severe storm, or other occurrence which might have damaged track structure, a special inspection shall be made of the track involved as soon as possible after the occurrence and, if possible, before the operation of any train over that track.

§ 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, 213.233, 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.

Subpart G—Train Operations at Track Classes 6 and Higher

§ 213.301 Scope of subpart.

This subpart applies to all track used for the operation of trains at a speed greater than 90 m.p.h. for passenger equipment and greater than 80 m.p.h. for freight equipment.

§ 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.

(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.

§ 213.307 Class of track: operating speed limits.

(a) Except as provided in paragraph (b) of this section and §§ 213.329, 213.337(a) and 213.345(c), the following maximum allowable operating speeds apply:

Over track that meets all of the requirements prescribed in this subpart for—	The maximum allowable operating speed for trains [1] is—
Class 6 track	110 m.p.h.
Class 7 track	125 m.p.h.
Class 8 track	160 m.p.h.[2]
Class 9 track	200 m.p.h.

[1] Freight may be transported at passenger train speeds if the following conditions are met:

(1) The vehicles utilized to carry such freight are of equal dynamic performance and have been qualified in accordance with Sections 213.345 and 213.329(d) of this subpart.

(2) The load distribution and securement in the freight vehicle will not adversely affect the dynamic performance of the vehicle. The axle loading pattern is uniform and does not exceed the passenger locomotive axle loadings utilized in passenger service operating at the same maximum speed.

(3) No carrier may accept or transport a hazardous material, as defined at 49 CFR 171.8, except as provided in Column 9A of the Hazardous Materials Table (49 CFR 172.101) for movement in the same train as a passenger-carrying vehicle or in Column 9B of the Table for movement in a train with no passenger-carrying vehicles.

[2] Operating speeds in excess of 150 m.p.h. are authorized by this part only in conjunction with a rule of particular applicability addressing other safety issues presented by the system.

(b) If a segment of track does not meet all of the requirements for its intended class, it is to be reclassified to the next lower class of track for which it does meet all of the requirements of this subpart. If a segment does not meet all of the requirements for Class 6, the requirements for Classes 1 through 5 apply.

§ 213.309 Restoration or renewal of track under traffic conditions.

(a) Restoration or renewal of track under traffic conditions is limited to the replacement of worn, broken, or missing components or fastenings that do not affect the safe passage of trains.

(b) The following activities are expressly prohibited under traffic conditions:

(1) Any work that interrupts rail continuity, e.g., as in joint bar replacement or rail replacement;

(2) Any work that adversely affects the lateral or vertical stability of the track with the exception of spot tamping an isolated condition where not more than 15 lineal feet of track are involved at any one time and the ambient air temperature is not above 95 degrees Fahrenheit; and

(3) Removal and replacement of the rail fastenings on more than one tie at a time within 15 feet.

§ 213.311 Measuring track not under load.

When unloaded track is measured to determine compliance with requirements of this subpart, evidence of rail movement, if any, that occurs while the track is loaded shall be added to the measurements of the unloaded track.

§ 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.

§ 213.319 Drainage.

Each drainage or other water carrying facility under or immediately adjacent to the roadbed shall be maintained and kept free of obstruction, to accommodate expected water flow for the area concerned.

§ 213.321 Vegetation.

Vegetation on railroad property which is on or immediately adjacent to roadbed shall be controlled so that it does not —

(a) Become a fire hazard to track-carrying structures;

(b) Obstruct visibility of railroad signs and signals:

(1) Along the right of way, and

(2) At highway-rail crossings;

(c) Interfere with railroad employees performing normal trackside duties;

(d) Prevent proper functioning of signal and communication lines; or

(e) Prevent railroad employees from visually inspecting moving equipment from their normal duty stations.

§ 213.323 Track gage.

(a) Gage is measured between the heads of the rails at right-angles to the rails in a plane five-eighths of an inch below the top of the rail head.

(b) Gage shall be within the limits prescribed in the following table:

Class of track	The gage must be at least—	But not more than—	The change of gage within 31 feet must not be greater than—
6	4′8″	4′9¼″	½″
7	4′8″	4′9¼″	½″
8	4′8″	4′9¼″	½″
9	4′8¼″	4′9¼″	½″

§ 213327 Alinement.

(a) Uniformity at any point along the track is established by averaging the measured mid-chord offset values for nine consecutive points centered around that point and which are spaced according to the following table:

Chord length	Spacing
31′	7′9″
62′	15′6″
124′	31′0″

(b) For a single deviation, alinement may not deviate from uniformity more than the amount prescribed in the following table:

Class of track	The deviation from uniformity of the mid-chord offset for a 31-foot chord may not be more than— (inches)	The deviation from uniformity of the mid-chord offset for a 62-foot chord may not be more than— (inches)	The deviation from uniformity of the mid-chord offset for a 124-foot chord may not be more than— (inches)
6	½	¾	1½
7	½	½	1¼
8	½	½	¾
9	½	½	¾

(c) For three or more non-overlapping deviations from uniformity in track alinement occurring within a distance equal to five times the specified chord length, each of which exceeds the limits in the following table, each owner of the track to which this subpart applies shall maintain the alinement of the track within the limits prescribed for each deviation:

Class of track	The deviation from uniformity of the mid-chord offset for a 31-foot chord may not be more than— (inches)	The deviation from uniformity of the mid-chord offset for a 62-foot chord may not be more than— (inches)	The deviation from uniformity of the mid-chord offset for a 124-foot chord may not be more than— (inches)
6	⅜	½	1
7	⅜	⅜	⅞
8	⅜	⅜	½
9	⅜	⅜	½

§ 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:

$$V_{max} = \sqrt{\frac{E_a + E_u}{0.0007D}}$$

Where—

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

E_a = Actual elevation of the outside rail (inches)[4].

D = Degree of curvature (degrees)[5].

3 = 3 inches of unbalance.

(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:

$$V_{max} = \sqrt{\frac{E_a + 3}{0.0007D}}$$

Where—

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

E_a = Actual elevation of the outside rail (inches)[4].

D = Degree of curvature (degrees)[5].

E_u = 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

[4] Actual elevation for each 155 foot track segment in the body of the curve is determined by averaging the elevation for 10 points through the segment at 15.5 foot spacing. If the curve length is less than 155 feet, average the points through the full length of the body of the curve. If E_u exceeds 4 inches, the Vmax formula applies to the spirals on both ends of the curve.

[5] Degree of curvature is determined by averaging the degree of curvature over the same track segment as the elevation.

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 ''E_u'' 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 [6] 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.

§ 213.331 Track surface.

(a) For a single deviation in track surface, each owner of the track to which this subpart applies shall maintain the surface of its track within the limits prescribed in the following table:

Track surface	Class of track			
	6 (inches)	7 (inches)	8 (inches)	9 (inches)
The deviation from uniform [1] profile on either rail at the midordinate of a 31-foot chord may not be more than	1	1	¾	½
The deviation from uniform profile on either rail at the midordinate of a 62-foot chord may not be more than	1	1	1	¾
The deviation from uniform profile on either rail at the midordinate of a 124-foot chord may not be more than	1¾	1½	1¼	1¼
The difference in crosslevel between any two points less than 62 feet apart may not be more than [2]	1½	1½	1½	1½

[1] Uniformity for profile is established by placing the midpoint of the specified chord at the point of maximum measurement.

[2] However, to control harmonics on jointed track with staggered joints, the crosslevel differences shall not exceed 1¼ inches in all of six consecutive pairs of joints, as created by 7 joints. Track with joints staggered less than 10 feet shall not be considered as having staggered joints. Joints within the 7 low joints outside of the regular joint spacing shall not be considered as joints for purposes of this footnote.

(b) For three or more non-overlapping deviations in track surface occurring within a distance equal to five times the specified chord length, each of which exceeds the limits in the following table, each owner of the track to which this subpart applies shall maintain the surface of the track within the limits prescribed for each deviation:

Track surface	Class of track			
	6 (inches)	7 (inches)	8 (inches)	9 (inches)
The deviation from uniform profile on either rail at the midordinate of a 31-foot chord may not be more than	¾	¾	½	⅜
The deviation from uniform profile on either rail at the midordinate of a 62-foot chord may not be more than	¾	¾	¾	½
The deviation from uniform profile on either rail at the midordinate of a 124-foot chord may not be more than	1¼	1	⅞	⅞

§ 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,

[6] The test procedure may be conducted in a test facility whereby all wheels on one side (right or left) of the equipment are raised or lowered by six and then seven inches, the vertical wheel loads under each wheel are measured and a level is used to record the angle through which the floor of the vehicle has been rotated.

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 1.25 [7], 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).

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

$$GWR = \frac{(LTG - UTG)}{L} \times 16{,}000$$

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.

VEHICLE/TRACK INTERACTION SAFETY LIMITS

Parameter	Safety limit	Filter/window	Requirements
Wheel/Rail Forces [1]			
Single Wheel Vertical Load Ratio	≥0.1	5 ft	No wheel of the equipment shall be permitted to unload to less than 10% of the static vertical wheel load. The static vertical wheel load is defined as the load that the wheel would carry when stationary on level track. The vertical wheel load limit shall be increased by the amount of measurement error.
Single Wheel L/V Ratio	≤ tanδ—.5 1 + .5tanδ	5 ft	The ratio of the lateral force that any wheel exerts on an individual rail to the vertical force exerted by the same wheel on the rail shall be less than the safety limit calculated for the wheel's flange angle (δ).

[7] GRMS equipment using load combinations developing L/V ratios which exceed 0.8 shall be operated with caution to protect against the risk of wheel climb by the test wheelset.

VEHICLE/TRACK INTERACTION SAFETY LIMITS

Parameter	Safety limit	Filter/window	Requirements
Net Axle L/V Ratio	≤ 0.5	5 ft	The net lateral force exerted by any axle on the track shall not exceed 50% of the static vertical load that the axle exerts on the track.
Truck Side L/V Ratio	≤ 0.6	5 ft	The ratio of the lateral forces that the wheels on one side of any truck exert on an individual rail to the vertical forces exerted by the same wheels on that rail shall be less than 0.6.
Accelerations			
Carbody Lateral [2]	≤ 0.5 g peak-to-peak	10 Hz 1 sec window.	The peak-to-peak accelerations, measured as the algebraic difference between the two extreme values of measured acceleration in a one second time period, shall not exceed 0.5 g.
Carbody Vertical [2]	≤ 0.6 g peak-to-peak	10 Hz 1 sec window.	The peak-to-peak accelerations, measured as the algebraic difference between the two extreme values of measured acceleration in a one-second time period, shall not exceed 0.6 g.
Truck Lateral [3]	≤ 0.4 g RMS mean-removed.	10 Hz 2 sec window.	Truck hunting [4] shall not develop below the maximum authorized speed.

[1] The lateral and vertical wheel forces shall be measured with instrumented wheelsets with the measurements processed through a low pass filter with a minimum cut-off frequency of 25 Hz. The sample rate for wheel force data shall be at least 250 samples/sec.
[2] Carbody lateral and vertical accelerations shall be measured near the car ends at the floor level.
[3] Truck accelerations in the lateral direction shall be measured on the truck frame. The measurements shall be processed through a filter having a pass band of 0.5 to 10 Hz.
[4] Truck hunting is defined as a sustained cyclic oscillation of the truck which is evidenced by lateral accelerations in excess of 0.4 g root mean square (mean-removed) for 2 seconds.

§ 213.334 Ballast; general.

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

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

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

(c) Provide adequate drainage for the track; and

(d) Maintain proper track crosslevel, surface, and alinement.

§ 213.335 Crossties.

(a) Crossties shall be made of a material to which rail can be securely fastened.

(b) Each 39 foot segment of track shall have—

(1) A sufficient number of crossties which in combination provide effective support that will—

(i) Hold gage within the limits prescribed in § 213.323(b);

(ii) Maintain surface within the limits prescribed in § 213.331; and

(iii) Maintain alinement within the limits prescribed in § 213.327.

(2) The minimum number and type of crossties specified in paragraph (c) of this section effectively distributed to support the entire segment; and

(3) Crossties of the type specified in paragraph (c) of this section that are(is) located at a joint location as specified in paragraph (e) of this section.

(c) For non-concrete tie construction, each 39 foot segment of Class 6 track shall have fourteen crossties; Classes 7, 8 and 9 shall have 18 crossties which are not—

(1) Broken through;

(2) Split or otherwise impaired to the extent the crossties will allow the ballast to work through, or will not hold spikes or rail fasteners;

(3) So deteriorated that the tie plate or base of rail can move laterally 3⁄8 inch relative to the crossties;

(4) Cut by the tie plate through more than 40 percent of a crosstie's thickness;

(5) Configured with less than 2 rail holding spikes or fasteners per tie plate; or

(6) So unable, due to insufficient fastener toeload, to maintain longitudinal restraint and maintain rail hold down and gage.

(d) For concrete tie construction, each 39 foot segment of Class 6 track shall have fourteen crossties, Classes 7, 8 and 9 shall have 16 crossties which are not—

(1) So deteriorated that the prestress strands are ineffective or withdrawn into the tie at one end and the tie exhibits structural cracks in the rail seat or in the gage of track;

(2) Configured with less than 2 fasteners on the same rail;

(3) So deteriorated in the vicinity of the rail fastener such that the fastener assembly may pull out or move laterally more than 3⁄8 inch relative to the crosstie;

(4) So deteriorated that the fastener base plate or base of rail can move laterally more than 3⁄8 inch relative to the crossties;

(5) So deteriorated that rail seat abrasion is sufficiently deep so as to cause loss of rail fastener toeload;

(6) Completely broken through; or

(7) So unable, due to insufficient fastener toeload, to maintain longitudinal restraint and maintain rail hold down and gage.

(e) Class 6 track shall have one non-defective crosstie whose centerline is within 18 inches of the rail joint location or two crossties whose center lines are within 24 inches either side of the rail joint location. Class 7, 8, and 9 track shall have two non-defective ties within 24 inches each side of the rail joint.

(f) For track constructed without crossties, such as slab track and track connected directly to bridge structural components, the track structure shall meet the requirements of paragraphs (b)(1)(i), (ii), and (iii) of this section.

(g) In Classes 7, 8 and 9 there shall be at least three non-defective ties each side of a defective tie.

(h) Where timber crossties are in use there shall be tie plates under the running rails on at least nine of 10 consecutive ties.

(i) No metal object which causes a concentrated load by solely supporting a rail shall be allowed between the base of the rail and the bearing surface of the tie plate.

§ 213.337 Defective rails.

(a) When an owner of track to which this part applies learns, through inspection or otherwise, that a rail in that track contains any of the defects listed in the following table, a person designated under § 213.305 shall determine whether or not the track may continue in use. If the person determines that the track may continue in use, operation over the defective rail is not permitted until—

(1) The rail is replaced; or

(2) The remedial action prescribed in the table is initiated—

REMEDIAL ACTION

Defect	Length of defect (inch)		Percent of rail head cross-sectional area weakened by defect		If defective rail is not replaced, take the remedial action prescribed in note
	More than	But not more than	Less than	But not less than	
Transverse fissure			70	5	B.
			100	70	A2.
				100	A.
Compound fissure			70	5	B.
			100	70	A2.
				100	A.
Detail fracture Engine burn fracture Defective weld.			25	5	C.
			80	25	D.
			100	80	[A2] or [E and H.]
				100	[A] or [E and H].
Horizontal split head Vertical split head Split web Piped rail.	1	2			H and F.
	2	4			I and G.
	4				B.
Head web separation	(1)	(1)	(1)		A.
	½	1			H and F.
Bolt hole crack	1	1½			H and G.
	1½				A.
	(1)	(1)	(1)		A.
Broken base	1	6			D.
	6				[A] or [E and I].
Ordinary break					A or E.
Damaged rail					D.
Flattened rail	Depth ≥ ⅜ and				H.
	Length ≥ 8				

(1) Break out in rail head.

Notes:

A. Assign person designated under § 213.305 to visually supervise each operation over defective rail.

A2. Assign person designated under § 213.305 to make visual inspection. That person may authorize operation to continue without visual supervision at a maximum of 10 m.p.h. for up to 24 hours prior to another such visual inspection or replacement or repair of the rail.

B. Limit operating speed over defective rail to that as authorized by a person designated under § 213.305(a)(1)(i) or (ii). The operating speed cannot be over 30 m.p.h.

C. Apply joint bars bolted only through the outermost holes to defect within 20 days after it is determined to continue the track in use. Limit operating speed over defective rail to 30 m.p.h. until joint bars are applied; thereafter, limit speed to 50 m.p.h. When a search for internal rail defects is conducted under § 213.339 and defects are discovered which require remedial action C, the operating speed shall be limited to 50 m.p.h., for a period not to exceed 4 days. If the defective rail has not been removed from the track or a permanent repair made within 4 days of the discovery, limit operating speed over the defective rail to 30 m.p.h. until joint bars are applied; thereafter, limit speed to 50 m.p.h.

D. Apply joint bars bolted only through the outermost holes to defect within 10 days after it is determined to continue the track in use. Limit operating speed over the defective rail to 30 m.p.h. or less as authorized by a person designated under § 213.305(a)(1)(i) or (ii) until joint bars are applied; thereafter, limit speed to 50 m.p.h.

E. Apply joint bars to defect and bolt in accordance with § 213.351(d) and (e).

F. Inspect rail 90 days after it is determined to continue the track in use.

G. Inspect rail 30 days after it is determined to continue the track in use.

H. Limit operating speed over defective rail to 50 m.p.h.

I. Limit operating speed over defective rail to 30 m.p.h.

(b) As used in this section—

(1) *Transverse fissure* means a progressive crosswise fracture starting from a crystalline center or nucleus inside the head from which it spreads outward as a smooth, bright, or dark, round or oval surface substantially at a right angle to the length of the rail. The distinguishing features of a transverse fissure from other types of fractures or defects are the crystalline center or nucleus and the nearly smooth surface of the development which surrounds it.

(2) *Compound fissure* means a progressive fracture originating in a horizontal split head which turns up or down in the head of the rail as a smooth, bright, or dark surface progressing until substantially at a right angle to the length of the rail. Compound fissures require examination of both faces of the fracture to locate the horizontal split head from which they originate.

(3) *Horizontal split head* means a horizontal progressive defect originating inside of the rail head, usually one-quarter inch or more below the running surface and progressing horizontally in all directions, and generally accompanied by a flat spot on the running surface. The defect appears as a crack lengthwise of the rail when it reaches the side of the rail head.

(4) *Vertical split head* means a vertical split through or near the middle of the head, and extending into or

through it. A crack or rust streak may show under the head close to the web or pieces may be split off the side of the head.

(5) *Split web* means a lengthwise crack along the side of the web and extending into or through it.

(6) *Piped rail* means a vertical split in a rail, usually in the web, due to failure of the shrinkage cavity in the ingot to unite in rolling.

(7) *Broken base* means any break in the base of the rail.

(8) *Detail fracture* means a progressive fracture originating at or near the surface of the rail head. These fractures should not be confused with transverse fissures, compound fissures, or other defects which have internal origins. Detail fractures may arise from shelly spots, head checks, or flaking.

(9) *Engine burn fracture* means a progressive fracture originating in spots where driving wheels have slipped on top of the rail head. In developing downward they frequently resemble the 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 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 shall 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, entrainment 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.

§ 213.339 Inspection of rail in service.

(a) A continuous search for internal defects shall be made of all rail in track at least twice annually with not less than 120 days between inspections.

(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 § 213.337(a).

(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 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.

§ 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 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 within six months following the effective date of this rule. 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 alinement 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.

§ 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 alinement 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(k).

(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.

§ 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.

§ 213.349 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 6, 7, 8 and 9	1/8	1/8

§ 213.351 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 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) Each rail shall be bolted with at least two bolts at each joint.

(e) 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 section do not apply. Those locations, when over 400 feet long, are considered to be continuous welded rail track and shall meet all the requirements for continuous welded rail track prescribed in this subpart.

(f) No rail shall have a bolt hole which is torch cut or burned.

(g) No joint bar shall be reconfigured by torch cutting.

§ 213.352 Torch cut rail.

(a) Except as a temporary repair in emergency situations no rail having a torch cut end shall be used. When a rail end with a torch cut is used in emergency situations, train speed over that rail shall not exceed the maximum allowable for Class 2 track. All torch cut rail ends in Class 6 shall be removed within six months of September 21, 1998.

(b) Following the expiration of the time limits specified in paragraph (a) of this section, any torch cut rail end not removed shall be removed within 30 days of discovery. Train speed over that rail shall not exceed the maximum allowable for Class 2 track until removed.

§ 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 1½ 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.

§ 213.355 Frog guard rails and guard faces; gage.

The guard check and guard face gages in frogs shall be within the limits prescribed in the following table—

Class of track	Guard check gage—The distance between the gage line of a frog to the guard line [1] of its guard rail or guarding face, measured across the track at right angles to the gage line,[2] may not be less than—	Guard face gage—The distance between guard lines,[1] measured across the track at right angles to the gage line,[2] may not be more than—
Class 6 track	4′ 6½″	4′ 5″
Class 7 track	4′ 6½″	4′ 5″
Class 8 track	4′ 6½″	4′ 5″
Class 9 track	4′ 6½″	4′ 5″

[1] A line along that side of the flangeway which is nearer to the center of the track and at the same elevation as the gage line.
[2] A line ⅝ inch below the top of the center line of the head of the running rail, or corresponding location of the tread portion of the track structure.

§ 213.357 Derails.

(a) Each track, other than a main track, which connects with a Class 7, 8 or 9 main track shall be equipped with a functioning derail of the correct size and type, unless railroad equipment on the track, because of grade characteristics cannot move to foul the main track.

(b) For the purposes of this section, a derail is a device which will physically stop or divert movement of railroad rolling stock or other railroad on-track equipment past the location of the device.

(c) Each derail shall be clearly visible. When in a locked position, a derail shall be free of any lost motion which would prevent it from performing its intended function.

(d) Each derail shall be maintained to function as intended.

(e) Each derail shall be properly installed for the rail to which it is applied.

(f) If a track protected by a derail is occupied by standing railroad rolling stock, the derail shall be in derailing position.

(g) Each derail on a track which is connected to a Class 7, 8 or 9 main track shall be interconnected with the signal system.

§ 213.359 Track stiffness.

(a) Track shall have a sufficient vertical strength to withstand the maximum vehicle loads generated at maximum permissible train speeds, cant deficiencies and surface defects. For purposes of this section, vertical track strength is defined as the track capacity to constrain vertical deformations so that the track shall return following maximum load to a configuration in compliance with the vehicle/track interaction safety limits and geometry requirements of this subpart.

(b) Track shall have sufficient lateral strength to withstand the maximum thermal and vehicle loads generated at maximum permissible train speeds, cant deficiencies and lateral alinement defects. For purposes of this section lateral track strength is defined as the track capacity to constrain lateral deformations so that track shall return following maximum load to a configuration in compliance with the vehicle/track interaction safety limits and geometry requirements of this subpart.

§ 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.

§ 213.365 Visual inspections.

(a) All track shall be visually inspected in accordance with the schedule prescribed in paragraph (c) of this section by a person designated under § 213.305.

(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 inspector's 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	Required frequency
6, 7, and 8.	Twice weekly with at least 2 calendar-day's interval between inspections.
9	Three times per week.

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

(e) Each switch, turnout, crossover, and lift rail assemblies on moveable bridges shall be inspected on foot at least weekly. The inspection shall be accomplished in accordance with the Guidebook required under § 213.353.

(f) In track Classes 8 and 9, if no train traffic operates for a period of eight hours, a train shall be operated at a speed not to exceed 100 miles per hour over the track before the resumption of operations at the maximum authorized speed.

§ 213.367 Special inspections.

In the event of fire, flood, severe storm, temperature extremes or other occurrence which might have damaged track structure, a special inspection shall be made of the track involved as soon as possible after the occurrence and, if possible, before the operation of any train over that track.

§ 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.

Appendix A to Part 213—Maximum Allowable Curving Speeds

TABLE 1.—THREE INCHES UNBALANCE

[Elevation of outer rail (inches)]

Degree of curvature	0	½	1	1½	2	2½	3	3½	4	4½	5	5½	6
	Maximum allowable operating speed (mph)												
0°30′	93	100	107	113	120	125	131	136	141	146	151	156	160
0°40′	80	87	93	98	103	109	113	118	122	127	131	135	139
0°50′	72	78	83	88	93	97	101	106	110	113	117	121	124
1°00′	66	71	76	80	85	89	93	96	100	104	107	110	113
1°15′	59	63	68	72	76	79	83	86	89	93	96	99	101
1°30′	54	58	62	66	69	72	76	79	82	85	87	90	93
1°45′	50	54	57	61	64	67	70	73	76	78	81	83	86
2°00′	46	50	54	57	60	63	66	68	71	73	76	78	80
2°15′	44	47	50	54	56	59	62	64	67	69	71	74	76
2°30′	41	45	48	51	54	56	59	61	63	66	68	70	72
2°45′	40	43	46	48	51	54	56	58	60	62	65	66	68
3°00′	38	41	44	46	49	51	54	56	58	60	62	64	66

TABLE 1.—THREE INCHES UNBALANCE—Continued

[Elevation of outer rail (inches)]

Degree of curvature	0	½	1	1½	2	2½	3	3½	4	4½	5	5½	6
3°15′	36	39	42	45	47	49	51	54	56	57	59	61	63
3°30′	35	38	40	43	45	47	50	52	54	55	57	59	61
3°45′	34	37	39	41	44	46	48	50	52	54	55	57	59
4°00′	33	35	38	40	42	44	46	48	50	52	54	55	57
4°30′	31	33	36	38	40	42	44	45	47	49	50	52	54
5°00′	29	32	34	36	38	40	41	43	45	46	48	49	51
5°30′	28	30	32	34	36	38	40	41	43	44	46	47	48
6°00′	27	29	31	33	35	36	38	39	41	42	44	45	46
6°30′	26	28	30	31	33	35	36	38	39	41	42	43	45
7°00	25	27	29	30	32	34	35	36	38	39	40	42	43
8°00′	23	25	27	28	30	31	33	34	35	37	38	39	40
9°00′	22	24	25	27	28	30	31	32	33	35	36	37	38
10°00′	21	22	24	25	27	28	29	31	32	33	34	35	36
11°00′	20	21	23	24	26	27	28	29	30	31	32	33	34
12°00′	19	20	22	23	24	26	27	28	29	30	31	32	33

TABLE 2.—FOUR INCHES UNBALANCE

[Elevation of outer rail (inches)]

Degree of curvature	0	½	1	1½	2	2½	3	3½	4	4½	5	5½	6
	Maximum allowable operating speed (mph)												
0°30′	107	113	120	125	131	136	141	146	151	156	160	165	169
0°40′	93	98	104	109	113	118	122	127	131	135	139	143	146
0°50′	83	88	93	97	101	106	110	113	117	121	124	128	131
1°00′	76	80	85	89	93	96	100	104	107	110	113	116	120
1°15′	68	72	76	79	83	86	89	93	96	99	101	104	107
1°30′	62	65	69	72	76	79	82	85	87	90	93	95	98
1°45′	57	61	64	67	70	73	76	78	81	83	86	88	90
2°00′	53	57	60	63	65	68	71	73	76	78	80	82	85
2°15′	50	53	56	59	62	64	67	69	71	73	76	78	80
2°30′	48	51	53	56	59	61	63	65	68	70	72	74	76
2°45′	46	48	51	53	56	58	60	62	64	66	68	70	72
3°00′	44	46	49	51	53	56	58	60	62	64	65	67	69
3°15′	42	44	47	49	51	53	55	57	59	61	63	65	66
3°30′	40	43	45	47	49	52	53	55	57	59	61	62	64
3°45′	39	41	44	46	48	50	52	53	55	57	59	60	62
4°00′	38	40	42	44	46	48	50	52	53	55	57	58	60
4°30′	36	38	40	42	44	45	47	49	50	52	53	55	56
5°00′	34	36	38	40	41	43	45	46	48	49	51	52	53
5°30′	32	34	36	38	39	41	43	44	46	47	48	50	51
6°00′	31	33	35	36	38	39	41	42	44	45	46	48	49
6°30′	30	31	33	35	36	38	39	41	42	43	44	46	47
7°00′	29	30	32	34	35	36	38	39	40	42	43	44	45
8°00′	27	28	30	31	33	34	35	37	38	39	40	41	42
9°00′	25	27	28	30	31	32	33	35	36	37	38	39	40
10°00′	24	25	27	28	29	30	32	33	34	35	36	37	38
11°00′	23	24	25	27	28	29	30	31	32	33	34	35	36
12°00′	22	23	24	26	27	28	29	30	31	32	33	34	35

Appendix B to Part 213—Schedule of Civil Penalties

Section	Violation	Willful Violation [1]
Subpart A—General:		
213.4(a) Excepted track [2]	$2,500	$5,000
213.4(b) Excepted track [2]	2,500	5,000
213.4(c) Excepted track [2]	2,500	5,000
213.4(d) Excepted track [2]	2,500	5,000
213.4(e):		
(1) Excepted track [2]	5,000	7,500
(2) Excepted track [2]	7,000	10,000
(3) Excepted track [2]	7,000	10,000
(4) Excepted track [2]	5,000	7,500
213.4(f) Excepted track	2,000	4,000
213.7 Designation of qualified persons to supervise certain renewals and inspect track	1,000	2,000
213.9 Classes of track: Operating speed limits	2,500	2,500
213.11 Restoration or renewal of track under traffic conditions	2,500	2,500
213.13 Measuring track not under load	1,000	2,000
Subpart B—Roadbed:		
213.33 Drainage	2,500	5,000
213.37 Vegetation	1,000	2,000

Section	Violation	Willful Violation [1]
Subpart C—Track Geometry:		
213.53 Gage	5,000	7,500
13.55 Alinement	5,000	7,500
213.57 Curves; elevation and speed limitations	2,500	5,000
213.59 Elevation of curved track; runoff	2,500	2,500
213.63 Track surface	5,000	7,500
Subpart D—Track surface:		
213.103 Ballast; general	2,500	5,000
213.109 Crossties		
(a) Material used	1,000	2,000
(b) Distribution of ties	2,500	5,000
(c) Sufficient number of nondefective ties	1,000	2,000
(d) Joint ties	2,500	5,000
(e) Track constructed without crossties	2,500	5,000
213.113 Defective rails	5,000	7,500
213.115 Rail end mismatch	2,500	5,000
213.119 Continuous welded rail		
(a) through (h)	5,000	7,500
213.121 (a) Rail joints	2,500	5,000
213.121 (b) Rail joints	2,500	5,000
213.121 (c) Rail joints	5,000	7,500
213.121 (d) Rail joints	2,500	5,000
213.121 (e) Rail joints	2,500	5,000
213.121 (f) Rail joints	2,500	5,000
213.121 (g) Rail joints	2,500	5,000
213.121 (h) Rail joints	5,000	7,500
213.122 Torch cut rail	2,500	5,000
213.123 Tie plates	1,000	2,000
213.127 Rail fastenings	2,500	5,000
213.133 Turnouts and track crossings, generally	1,000	1,000
213.135 Switches:		
(a) through (g)	2,500	5,000
(h) chipped or worn points	5,000	7,500
213.137 Frogs	2,500	5,000
213.139 Spring rail frogs	2,500	5,000
213.141 Self-guarded frogs	2,500	5,000
213.143 Frog guard rails and guard faces; gage	2,500	5,000
Subpart E—Track appliances and track-related devices:		
213.205 Derails	2,500	5,000
Subpart F—Inspection:		
213.233 Track inspections	2,000	4,000
213.235 Switches, crossings, transition devices	2,000	4,000
213.237 Inspection of rail	2,500	5,000
213.239 Special inspections	2,500	5,000
213.241 Inspection records	1,000	1,000
Subpart G—High Speed:		
213.305 Designation of qualified individuals; general qualifications	1,000	2,000
213.307 Class of track; operating speed limits	2,500	5,000
213.309 Restoration or renewal of track under traffic conditions	2,500	5,000
213.311 Measuring track not under load	1,000	2,000
213.319 Drainage	2,500	5,000
213.321 Vegetation	1,000	2,000
213.323 Track gage	5,000	7,500
213.327 Alinement	5,000	7,500
213.329 Curves, elevation and speed limits	2,500	5,000
213.331 Track surface	5,000	7,500
213.333 Automated vehicle inspection systems	5,000	7,500
213.335 Crossties		
(a) Material used	1,000	2,000
(b) Distribution of ties	2,500	5,000
(c) Sufficient number of nondefective ties, non-concrete	1,000	2,000
(d) Sufficient number of nondefective concrete ties	1,000	2,000
(e) Joint ties	2,500	5,000
(f) Track constructed without crossties	2,500	5,000
(g) Non-defective ties surrounding defective ties	2,500	5,000
(h) Tie plates	2,500	5,000
(i) Tie plates	1,000	2,000
213.337 Defective rails	5,000	7,500
213.339 Inspection of rail in service	2,500	5,000
213.341 Inspection of new rail	2,500	5,000
213.343 Continuous welded rail (a) through (h)	5,000	7,500
213.345 Vehicle qualification testing (a) through (b)	5,000	7,500
(c) through (e)	2,500	5,000

Section	Violation	Willful Violation [1]
213.347 Automotive or railroad crossings at grade	5,000	7,500
213.349 Rail end mismatch	2,500	5,000
213.351 (a) Rail joints	2,500	5,000
213.351 (b) Rail joints	2,500	5,000
213.351 (c) Rail joints	5,000	7,500
213.351 (d) Rail joints	2,500	5,000
213.351 (e) Rail joints	2,500	5,000
213.351 (f) Rail joints	5,000	7,500
213.351 (g) Rail joints	5,000	7,500
213. 352 Torch cut rails	2,500	5,000
213.353 Turnouts, crossovers, transition devices	1,000	2,000
213.355 Frog guard rails and guard faces; gage	2,500	5,000
213.357 Derails	2,500	5,000
213.359 Track stiffness	5,000	7,500
213.361 Right of way	5,000	7,500
213.365 Visual inspections	2,500	5,000
213.367 Special inspections	2,500	5,000
213.369 Inspections records	2,000	4,000

[1] A penalty may be assessed against an individual only for a willful violation. The Administrator reserves the right to assess a penalty of up to $22,000 for any violation where circumstances warrant. See 49 CFR Part 209, Appendix A.

[2] In addition to assessment of penalties for each instance of noncompliance with the requirements identified by this footnote, track segments designated as excepted track that are or become ineligible for such designation by virtue of noncompliance with any of the requirements to which this footnote applies are subject to all other requirements of Part 213 until such noncompliance is remedied.

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Jolene M. Molitoris,

Administrator, Federal Railroad Administration.

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