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Brake System Safety Standards for Freight and Other Non-Passenger Trains and Equipment; End-of-Train Devices; Final Rule

DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

49 CFR Parts 229, 231, and 232

[FRA Docket No. PB–9; Notice No. 17]

RIN 2130–AB16

Brake System Safety Standards for Freight and Other Non-Passenger Trains and Equipment; End-of-Train Devices

AGENCY: Federal Railroad Administration (FRA), DOT.

ACTION: Final Rule.

SUMMARY: FRA is issuing revisions to the regulations governing the power braking systems and equipment used in freight and other non-passenger railroad train operations. The revisions are designed to achieve safety by better adapting the regulations to the needs of contemporary railroad operations and facilitating the use of advanced technologies. These revisions are being issued in order to comply with Federal legislation, to respond to petitions for rulemaking, and to address areas of concern derived from experience in the application of existing standards governing these operations.

EFFECTIVE DATE: April 1, 2001. The incorporation by reference of certain publications listed in the rule is approved by the Director of the Federal Register as of April 1, 2001.

ADDRESSES: Any petition for reconsideration should reference FRA Docket No. PB–9, Notice 17, and be submitted in triplicate to FRA Docket Clerk, Office of Chief Counsel, RCC–10, 1120 Vermont Avenue, Mail Stop 10, Washington, DC 20590.

FOR FURTHER INFORMATION, CONTACT: Leon Smith, Deputy Regional Administrator—Region 3, FRA Office of Safety, RRS–14, 1120 Vermont Avenue, Stop 25, Washington, DC 20590 (telephone 404–562–3800), or Thomas Herrmann, Trial Attorney, Office of the Chief Counsel, RCC–10, 1120 Vermont Avenue, Stop 10, Washington, DC 20590 (telephone 202–493–6053).

SUPPLEMENTARY INFORMATION:

I. Background

In 1992, Congress amended the Federal rail safety laws by adding certain statutory mandates related to power brake safety. *See* 49 U.S.C. 20141. These amendments specifically address the revision of the power brake regulations by adding a new subsection which states:

> (r) POWER BRAKE SAFETY.—(1) The Secretary shall conduct a review of the Department of Transportation's rules with respect to railroad power brakes, and not later than December 31, 1993, shall revise such rules based on such safety data as may be presented during that review.
>
> (2) In carrying out paragraph (1), the Secretary shall, where applicable, prescribe standards regarding dynamic brake equipment. * * *
>
> Pub. L. 102–365, section 7; codified at 49 U.S.C. 20141, superseding 45 U.S.C. 431(r).

In response to the statutory mandate, the various recommendations and petitions for rulemaking, and due to its own determination that the power brake regulations were in need of revision, FRA published an Advance Notice of Proposed Rulemaking (ANPRM) on December 31, 1992 (57 FR 62546), and conducted a series of public workshops in early 1993. The ANPRM provided background information and presented questions on various subjects including the following: the use and design of end-of-train (EOT) telemetry devices; the air flow method of train brake testing; the additional testing of train air brakes during extremely cold weather; the training of employees to perform train brake tests and inspections; computer-assisted braking systems; the operation of dynamic brakes on locomotives; and other miscellaneous subjects relating to conventional brake systems as well as information regarding high speed passenger train brakes. The questions presented in the ANPRM on the various topics were intended as fact-finding tools and were meant to elicit the views of those persons outside FRA charged with ensuring compliance with the power brake regulations on a day-to-day basis.

Based on the comments and information received, FRA published a Notice of Proposed Rulemaking (1994 NPRM) regarding revisions to the power brake regulation. *See* 59 FR 47676 (September 16, 1994). In the 1994 NPRM, FRA proposed a comprehensive revision of the power brake regulations which attempted to preserve the useful elements of the current regulatory system in the framework of an entirely new document. FRA attempted to delineate the requirements for conventional freight braking systems from the more diverse systems for various categories of passenger service. In developing the NPRM, FRA engaged in a systems approach to the power brake regulations. FRA considered all aspects of a railroad operation and the effects that the entire operation had on the train and locomotive power braking systems. Therefore, the proposed requirements not only addressed specific brake equipment and inspection requirements, but also attempted to encompass other aspects of a railroad's operation which directly affect the quality and performance of the braking system, such as personnel qualifications; maintenance requirements; written procedures governing operation, maintenance, and inspection; record keeping requirements; and the development and integration of new technologies.

Following publication of the 1994 NPRM in the **Federal Register**, FRA held a series of public hearings in 1994 to allow interested parties the opportunity to comment on specific issues addressed in the NPRM. Public hearings were held in Chicago, Illinois on November 1–2; in Newark, New Jersey on November 4; in Sacramento, California on November 9; and in Washington, DC on December 13–14, 1994. These hearings were attended by numerous railroads, organizations representing railroads, labor organizations, rail shippers, and State governmental agencies. Due to the strong objections raised by a large number of commenters at these public hearings, FRA announced by notice published on January 17, 1995 that it would defer action on the NPRM and permit the submission of additional comments prior to making a determination as to how it would proceed in this matter. *See* 60 FR 3375. Although the comment period officially closed April 1, 1995, FRA continued to receive comments on the NPRM as well as other suggested alternatives well into October 1995.

Furthermore, beginning in mid-1995, FRA internally committed to the process of establishing the Railroad Safety Advisory Committee (RSAC). The determination to develop the RSAC was based on FRA's belief that the continued use of ad hoc collaborative procedures for appropriate rulemakings was not the most effective means of accomplishing its goal of a more consensual regulatory program. FRA believed that the establishment of an advisory committee to address railroad safety issues would provide the best opportunity for creating a consensual regulatory program to benefit the Administrator in the conduct of her statutory responsibilities. FRA envisioned that the RSAC would allow representatives from management, labor, FRA, and other interested parties to cooperatively address safety problems by identifying the best solutions based on agreed-upon facts, and, where regulation appears necessary, by identifying regulatory options to implement these solutions. The process of establishing the RSAC was not complete until March 1, 1996, and on March 11, 1996, FRA published a notice

in the **Federal Register** that the Committee had been established. *See* 61 FR 9740.

In the interim, based on these considerations and after review of all the comments submitted, FRA published a notice in the **Federal Register** on February 21, 1996, stating that, in order to limit the number of issues to be examined and developed in any one proceeding, FRA would proceed with the revision of the power brake regulations via three separate processes. *See* 61 FR 6611. In light of the testimony and comments received on the 1994 NPRM, emphasizing the differences between passenger and freight operations and the brake equipment utilized by the two, FRA decided to separate passenger equipment power brake standards from freight equipment power brake standards. As passenger equipment power brake standards are a logical subset of passenger equipment safety standards, it was determined that the passenger equipment safety standards working group would assist FRA in developing a second NPRM covering passenger equipment power brake standards. *See* 49 U.S.C. 20133(c). In addition, in the interest of public safety and due to statutory as well as internal commitments, FRA determined that it would separate the issues related to two-way EOTs from both the passenger and freight issues, address them in a public regulatory conference, and issue a final rule on the subject as soon as practicable. A final rule on two-way EOTs was issued on December 27, 1996. *See* 62 FR 278 (January 2, 1997). Furthermore, it was announced that a second NPRM covering freight equipment power brake standards would be developed with the assistance of RSAC. At the Committee's inaugural meeting on April 1–2, 1996, the RSAC officially accepted the task of assisting FRA in development of revisions to the regulations governing power brake systems for freight equipment. *See* 61 FR 29164.

Members of RSAC nominated individuals to be members of the Freight Power Brake Working Group (Working Group) tasked with making recommendations regarding revision of the power regulations applicable to freight operations. The Working Group was comprised of thirty-one voting members as well as a number of alternates and technical support personnel. The following organizations were represented by a voting member and/or an alternate on the Working Group:

Association of American Railroads (AAR)
The American Short Line Railroad Association (ASLRA)
Brotherhood of Locomotive Engineers (BLE)
The Burlington Northern and Santa Fe Railway Company (BNSF)
Canadian National Railroads (CN)
Canadian Pacific Rail Systems (CP)
Consolidated Rail Corporation (CR)
CSX Transportation, Incorporated (CSX)
Illinois Central Railroad Company (IC)
International Association of Machinists & Aerospace Workers (IAMAW)
National Transportation Safety Board (NTSB)(Advisor)
National Association of Regulatory Commissioners (NARUC)
California Public Utilities Commission (CAPUC)
Norfolk Southern Corporation (NS)
Railway Progress Institute (RPI)
Sheet Metal Workers International Association (SMWIA)
Southern Pacific Lines (SP)
Transportation Communications International Union/Brotherhood of Railway Carmen (TCU/BRC)
Transport Workers Union of America (TWU)
Union Pacific Railroad Company (UP)
United Transportation Union (UTU)

The Working Group held seven multi-day sessions in which all members of the working group were invited. These sessions were held on the following dates:

May 15–17, 1996 in Washington D.C.;
June 11–13, 1996 in Chicago, Illinois;
July 31, 1996 in Chicago, Illinois;
August 21–23, 1996 in Annapolis, Maryland;
September 26–27, 1996 in Washington D.C.;
October 29–30, 1996 in Washington D.C.; and
December 4, 1996 in St. Louis, Missouri.

General minutes of each of these meetings are contained in FRA Docket PB–9 and are available for public inspection during the times and at the location noted previously. In addition to these meetings, there were numerous meetings conducted by smaller task force groups designated by the Working Group to further develop various issues. All of these smaller task forces were made up of various members of the Working Group or their representatives, with each task force being represented by management, labor, FRA, and other interested parties. The Working Group designated smaller task forces to address the following issues: Dry air; dynamic brakes; periodic maintenance and testing; electronically controlled locomotive brakes; and inspection and testing requirements. These task forces were assigned the job of developing the issues related to the broad topics, presenting reports to the larger Working Group, and if possible making recommendations to the Working Group for addressing the issues.

Although the Working Group discussed, debated, and attempted to reach consensus on various issues related to freight power brakes, consensus could not be reached. However, the working group in conjunction with the various task forces developed a wealth of information on various issues and further clarified the parties' positions regarding how the issues could or should be addressed in any regulation. The major cluster of issues, upon which resolution of many of the other issues rested, were the requirements related to the inspection and testing of brake equipment. The inspection and testing task force met on numerous occasions and gathered and reviewed data, and the labor and rail management representatives to the task force drafted various proposals and options related to the inspection and testing of freight brake equipment. The Working Group discussed the proposals and investigated many of the costs and benefits related to the various proposals as well as the safety implications; however, the Working Group could not reach any type of consensus position. Consequently, FRA declared that an impasse had been reached and announced, at the December 4, 1996 meeting of the Working Group, that FRA would proceed unilaterally with the drafting of the NPRM.

Subsequent to December 4, 1996, several members of the Working Group, including representatives from both rail management and labor, continued informal discussions of some of the issues related to the inspection and testing of freight equipment. These representatives informed FRA that a consensus proposal might be possible, provided that the Working Group were permitted to continue deliberations. Consequently, FRA agreed to reconvene the Working Group, and in April 1997 three additional meetings were conducted on the following dates:

April 2–3 in Kansas City, Missouri;
April 10–11 in Phoenix, Arizona; and
April 23 in Jacksonville, Florida.

Representatives of both rail management and rail labor presented the Working Group with inspection and testing proposals for consideration and review both before and during this period. Although the proposals were discussed and deliberated, the Working Group was once again unsuccessful in

reaching consensus on any of the freight power brake inspection and testing issues. Consequently, by letter dated May 29, 1997, FRA informed the members of the Working Group that FRA would be withdrawing the freight power brake task from the Working Group at the next full RSAC meeting on June 24, 1997. FRA provided this notice to avoid any misunderstanding regarding the process by which the proposed rule would be drafted. FRA also informed the members of the Working Group that it would not invest further time in attempting to reach consensus unless all other members of the Working Group jointly indicated that they have reached consensus on a proposal and wanted to discuss it with FRA. FRA noted that if that were to occur prior to June 24, 1997, it would reconsider withdrawing the task from RSAC. As no consensus proposal was presented to FRA prior to June 24, 1997, FRA withdrew the task from the Working Group and informed the members of RSAC that FRA would proceed independently in the drafting of a freight power brake NPRM.

FRA carefully considered the information, data, and proposals developed by the Freight Power Brake Working Group as well as all the oral and written comments offered by various parties regarding the 1994 NPRM on power brakes when developing a revised power brake NPRM. On September 9, 1998, an NPRM (1998 NPRM) was published in the **Federal Register** proposing brake system safety standards for freight trains and equipment. *See* 63 FR 48294 (September 9, 1998).

As evidenced by the preceding discussion, FRA spent years developing the 1998 proposed power brake regulations. During that time, FRA instituted rulemakings to address passenger and commuter operations and equipment and two-way end-of-train devices, and developed a channel of communication to address tourist and excursion operational concerns. Consequently, the 1998 proposal focused solely on freight and other non-passenger operations. FRA did not, for the most part, attempt to include provisions related to the inspection and maintenance of locomotive braking systems or to the performance of other mechanical inspections that are currently addressed by other parts of the regulations. FRA believed that although those requirements are interrelated to the inspection, testing, and maintenance of freight power brakes, they are adequately addressed in other regulations and would only add to the complexity of the proposal, causing confusion and misunderstanding by members of the regulated community.

When developing the 1998 NPRM, FRA determined that the proposal would closely track the existing requirements related to the inspection, testing, and maintenance of the braking systems used in freight operations. Although FRA recognized that the current regulatory scheme tended to create incentives to ''overlook'' defects or fail to conduct vigorous inspections, FRA also believed that the current regulatory scheme is an effective and proven method of ensuring safety and that many of the ''negative incentives'' could be greatly reduced by strict and aggressive enforcement coupled with moderate revisions to address specific concerns raised by interested parties. Furthermore, representatives of both rail labor and rail management indicated that if a consensus proposal could not be developed then FRA should proceed on its own with developing a proposal which tracks the current requirements, and that FRA should strictly enforce those requirements.

The 1998 NPRM proposed a moderate, although comprehensive, revision of the existing requirements related to the inspection, testing, and maintenance of brake equipment used in freight operations. The proposal attempted to balance the concerns of rail labor and management and increase the effectiveness of the regulation. In the 1998 NPRM, FRA attempted to reorganize, update, and clarify the existing regulations related to freight power brakes and eliminate potential loopholes created by the existing regulatory language. Furthermore, completely new requirements were proposed to address the qualifications of those individuals conducting brake inspections and tests. FRA also proposed requirements related to the movement of freight equipment with defective or inoperative brakes which were consistent with existing statutory requirements and other federal regulations addressing the movement of defective freight equipment. The 1998 NPRM also attempted to codify existing maintenance requirements related to the brake system and its components and prevent unilateral changes to those provisions by the very party to which they apply. Moreover, the proposal also contained specific requirements related to dynamic brakes and requirements aimed at increasing the quality of air introduced into brake systems by yard air sources.

In addition to the above, the 1998 proposal also contained various incentives to the railroads to encourage the performance of quality brake inspections, particularly at locations where trains originate. These included incentives to use qualified mechanical forces to conduct brake system tests at major terminals where long-distance trains originate in order to move these trains greater distances between brake inspections than existing regulations permitted. Consequently, the 1998 proposal retained the basic inspection intervals and requirements contained in the existing regulations and preserved the useful elements of the existing system, but also proposed additions, clarifications, and modifications that FRA believed would increase the safety, effectiveness, and enforceability of the regulations.

Following publication of the 1998 NPRM, FRA held two public hearings and a public technical conference to allow interested parties the opportunity to comment on specific issues addressed in the NPRM. The public hearings were held in Kansas City, Missouri on October 26 and in Washington, DC on November 13, 1998. The public technical conference was conducted in Walnut Creek, California on November 23 and 24, 1998. The hearings and technical conference were attended by numerous railroads, organizations representing railroads, labor organizations, rail shippers, and State governmental agencies. During the hearings and technical conference a vast amount of oral information was presented, and a considerable number of issues were raised and discussed in detail.

Subsequent to conducting these public hearings and technical conference, FRA issued a notice extending the comment period on the NPRM from January 15, 1999 to March 1, 1999. *See* 64 FR 3273. This extension was provided based on the requests of several interested parties for more time in which to develop their responses. At the public hearings and technical conference conducted in relation to the NPRM and in written comments submitted subsequent to the public hearings and technical conference, concerns were raised regarding the data discussed by FRA in the NPRM. The comments raised concerns regarding FRA's collection of data related to FRA's inspection activity and the number of conditions not in compliance with Federal regulations found during that inspection activity. The comments and correspondence received alleged that there were substantial problems with FRA's database, that there had been substantial overreporting of the number of units inspected, and that there had been a systematic deflation of power brake defect ratios.

As the allegations and concerns raised were general in nature, FRA believed it prudent and necessary to allow interested parties to fully explain and discuss their concerns. Therefore, FRA conducted a public meeting on May 27, 1999 to permit the exchange of information and concerns regarding FRA's database and the information developed from that database. *See* 64 FR 23816 (May 4, 1999). The purpose of the meeting was to allow FRA to provide information regarding its internal review of the data and address some of the concerns raised as well as to allow interested parties to further develop and articulate the issues and concerns they had with regard to the data gathered and presented by FRA in the NPRM.

FRA has carefully considered all the information, data, and proposals submitted in relation to FRA Docket PB–9 when developing this final rule. This includes: the information, data and proposals developed by the RSAC Freight Power Brake Working Group; all oral and written comments submitted in relation to the 1994 NPRM on power brakes; and all oral and written comments submitted regarding the 1998 NPRM on freight power brakes. In addition to the preceding information, FRA's knowledge and experience with enforcing the existing power brake regulations were also relied upon when developing this final rule.

II. Overview of Comments and General FRA Conclusions

The following discussions are grouped by major themes and issues addressed in the 1998 NPRM and the oral and written comments submitted in relation to that document. In each of the major issue areas, FRA has attempted to outline the significant portions of the proposal, discuss the comments received on the proposal and any alternative approach recommended, and provide a general idea of how FRA has decided to address the issues or approaches.

A. Accident/Incident History and Defective Equipment

The 1998 NPRM contained a detailed discussion regarding the accident/incident data which FRA considered when developing the proposal. In that discussion, FRA noted that it considers a variety of factors in attempting to determine the relative condition of the industry as it relates to the safety of train power brake systems. Two of the factors considered when making this assessment are the number of recent brake-related incidents and the amount of defective brake equipment recently discovered operating over the railroad system, both of which provide some indication as to the potential or likelihood of future brake-related incidents. Due to concerns raised in both written comments and at the public meeting conducted on May 27, 1999, regarding the accident/incident data and power brake defect ratio data discussed above, FRA believes it is necessary to further explain how these data were used in developing this final rule.

1. Accident/Incident Data

In order to determine the potential quantifiable safety benefits to be derived from the provisions proposed in the NPRM and either retained or modified in this final rule, FRA conducted a review of all accidents/incidents reported to FRA to determine which incidents/accidents could potentially have been prevented had the provisions of the rule been in place. For purposes of the NPRM, FRA identified a brake-related incident as being an incident reported to FRA as being caused by one of the following: brake rigging down or dragging; air hose uncoupled or burst; broken brake pipe or connections; other brake components damaged, worn, broken or disconnected; brake valve malfunction (undesired emergency); brake valve malfunction (stuck brake); hand brake broken or defective; hand brake linkage and/or connections broken or defective. For purposes of the NPRM, FRA did not consider brake pipe obstruction-related incidents because FRA believed they had been fully considered at the time that FRA promulgated the final rule relating to the use of two-way end-of-train devices.

In written comments and at the public meeting held in conjunction with the NPRM, several labor representatives raised concerns regarding FRA's reliance on accident/incident information which is essentially reported to FRA by the railroads. These representatives contend that railroads have an economic incentive to report accidents/incidents as being due to human factors rather than to mechanical problems or deficiencies. Thus, they contend that the potential safety benefits identified by FRA in the NPRM are inaccurate and underestimated because the data used to determine those benefits are developed by the railroads. FRA tends to agree with the concerns raised by these commenters and raised this concern in its discussion of the accident/incident data in the NPRM.

In the NPRM, FRA acknowledged that the presented brake-related incidents most likely did not accurately reflect the total number of incidents that were potentially linked, in some part, to brake-related causes and did not provide a complete picture of the costs associated with the identified incidents. *See* 63 FR 48297. FRA recognized that the information on most incidents is provided by the railroads which generally identify the direct cause of an incident but may not sufficiently identify all of the contributory causes in a manner to permit FRA to conclude that the brake system played a part in the incident. Thus, FRA acknowledged that there may be numerous incidents which occurred in the industry which were at least partially due to brake-related problems, but which were ultimately more closely linked to human error or other mechanical problems and thus, were reported to FRA under different cause codes. However, as it is extremely difficult to identify those accidents/incidents that may have been in some part related to a brake problem, FRA elected to include only those accidents specifically identified as brake-related in its quantified safety benefits and included other potential incidents as qualitative safety benefits in the NPRM. FRA also recognized that the damage costs provided to FRA by the railroads for the incidents identified in the NPRM failed to consider all of the costs associated with an accident such as: loss of lading; wreck clearance; track delay; environmental clean-up; removal of damaged equipment; evacuations; or the impact on local traffic patterns. *See* 63 FR 48297. Thus, for purposes of the NPRM, the property damages reported by the railroads were multiplied by a factor of 1.5625 in an effort to capture these non-reported damages. *See* 63 FR 48297.

In calculating the potential quantifiable safety benefits to be derived from this final rule, FRA has slightly expanded the criteria for determining the accidents/incidents which are addressed by this final rule. Thus, for purposes of this final rule the quantified safety benefits include a percentage of certain types of accidents reported as being due to human error or other than a brake-related mechanical problem. The quantified safety benefits for this final rule also include a percentage of those incidents which are considered brake pipe obstruction-related. Although these accidents were considered in relation to the two-way EOT final rule, FRA believes that this final rule will prevent an additional percentage of those incidents that were not captured by the two-way EOT final rule.

Table 1 below contains a compilation of the relevant incidents that FRA

considers to be preventable that have been reported to FRA from 1994 through 1998. The incidents included in this table contain incidents reported to FRA as being caused by one of the following: Brake rigging down or dragging; air hose uncoupled or burst; broken brake pipe or connections; other brake components damaged, worn, broken or disconnected; brake valve malfunction (undesired emergency); brake valve malfunction (stuck brake); hand brake broken or defective; hand brake linkage and/or connections broken or defective. Table 1 also contains incidents reported as being related to brake pipe obstructions and certain brake-related human factor incidents which include: runaway cuts of cars; train handling; and improper use of brakes. FRA believes that various provisions of this final rule have the potential of preventing a certain percentage of the incidents reported as being due to these causes. However, in developing the cost/benefit analysis for this final rule, FRA used a very conservative effectiveness rate of .2 for incidents with these reported causes. The Regulatory Impact Analysis prepared in connection with this final rule provides a detailed discussion of how certain human factor and brake pipe obstruction incidents were utilized when evaluating this rule.

It should be noted that the damage costs noted in Table 1 for the identified incidents are based on the damage to railroad property or equipment. Thus, the damages presented fail to consider the costs associated with the injuries and fatalities involved. These costs are calculated in detail in the Regulatory Impact Analysis prepared in connection with this final rule. The costs presented in Table 1 also do not consider such things as: loss of lading; wreck clearance; track delay; environmental clean-up; removal of damaged equipment; evacuations; or the impact on local traffic patterns. Consequently, the railroad property damages have been multiplied by a factor of 1.5625 in an effort to capture some of these non-reported damages.[1]

TABLE 1.—BRAKE-RELATED INCIDENTS

Year	Number of accidents	Injuries	Fatalities	Damages *
1994	99	24	1	$11,414,346
1995	121	65	0	9,431,582
1996	112	44	3	20,637,986
1997	98	8	0	9,651,569
1998	121	3	0	10,791,626
Total	551	140	4	61,927,107

* Increased by 56.25% to reflect unreported damages.

2. Use of Power Brake Defect Data

A second factor that is considered by FRA, to some extent, in determining the relative condition of the industry in regard to the safety of power brake equipment is the percentage of equipment found with defective brakes during FRA inspections and special projects. As noted in the preceding discussions, the method for calculating and determining the percentage of equipment with defective brakes was a contentious subject within the RSAC Power Brake Working Group prior to the issuance of the NPRM and at the public hearings and meetings conducted subsequent to the issuance of the NPRM. In the NPRM, FRA provided a lengthy discussion regarding the data it had available regarding power brake defect ratios and the limitations regarding the use of such data. *See* 63 FR 48298. In that discussion, FRA explained that data on brake defects is collected by FRA inspectors as they do rail equipment inspections and during special projects conducted under the Safety Assurance and Compliance Program (SACP). The NPRM made clear that the data collected during these activities is not suitable for use in any statistical analysis of brake defects.

In order to perform a statistically valid analysis, either all cars and locomotives must be inspected (prohibitively expensive), or a statistically valid sample must be collected. For the sample to be valid for the purpose of statistical analysis, the sample must be randomly selected so that it will represent the same characteristics as the universe of data. Random samples have several unique characteristics. They are unbiased, meaning that each unit has the same chance of being selected. Random samples are independent, or the selection of one unit has no influence on the selection of other units. Most statistical methods depend on independence and lack of bias. Without a randomized sample design there can be no dependable statistical analysis, and no way to measure sampling error, no matter how the data is modified. Random sampling ''statistically guarantees'' the accuracy of the results.

The sampling method used for regular FRA inspections is not random. It is more of a combination between a *judgement* sample and an opportunity sample. The opportunity sample basically just takes the first sample population that comes along, while the judgement sample is based on ''expert'' opinion. The sampling method used for SACP inspections is also a judgement sample, where FRA is focusing its inspections on a specific safety concern. This method is extremely prone to bias, as FRA is typically investigating known problem areas. Furthermore, some SACP inspections are joint inspections with labor. Consequently, it is unknown whether the final reports reflect only FRA defects, as many of the joint inspections had both AAR and FRA defects recorded.

Neither the regular FRA inspections nor the SACP inspections were designed for random data collection. Although both are very useful to FRA, they were not designed for this purpose and the data should be used carefully. FRA believes that data collected during routine inspections are the most likely data to accurately reflect the condition of the fleet. However, both FRA inspection data and SACP data lack any measuring device, a defect is a defect and no distinction is made between a critical defect versus a minor defect. Furthermore, the estimated correlation coefficients between defects and

[1] AAR surveyed its members and reported that, on average, these other costs constitute an additional 56.25 percent of the reported damages.

accidents were not found to be statistically significant. This does not mean that defects cannot lead to collisions or derailments as the lack of correlation could easily be a result of non-random sampling. Therefore, the data collected both during routine FRA inspections and under SACP cannot be used as a proxy for data collected by means of a random sample for the purpose of statistical analysis. The sample is not random, so no dependable statistical analysis may be performed. Consequently, FRA did not and will not use the data regarding power brake defects for the purpose of conducting any type of statistical analysis.

In the NPRM, FRA provided brake defect ratio's for the years 1993 through 1997 based upon the data contained in its database. *See* 63 FR 48298, Table 2. The average brake defect ratio for this five year period was 3.84 percent. The NPRM also noted that the available SACP data (which focuses on known problem areas) indicated brake defect ratios as high as 35 percent at some locations. FRA stated that the SACP data in all likelihood indicates that there are localized areas of concern and that some railroads have particular yards or operations with persistent problems. The NPRM attempted to make clear that FRA believes that brake defects are in all likelihood higher than that indicated by FRA's database and that the reality of power brake defects lies somewhere between the 3.84 percent represented in FRA's database and the 35 percent found at certain locations. FRA noted that actual power brake defect ratios are probably closer to the percentage reflected in FRA's database because FRA examines almost ½ million freight cars and locomotives annually. Thus, contrary to the assertions of certain commenters, FRA did not assert or contend that the power brake defect ratios represented by its database were an accurate or precise reflection as to the relative condition of the industry. In fact, as evidenced by the preceding discussion, FRA attempted to point out the limited usefulness of the data contained in its database. Furthermore, review of the defect data submitted by the BRC at the technical conference in Walnut Creek, California, as discussed below, appears to support FRA's conclusions regarding power brake defect ratios.

The NPRM made clear that the power brake defect ratios indicated in FRA's database were specifically relied on only to calculate the cost of the requirement to conduct retests on cars found with brakes that are not applied during the performance of the various required brake tests. Power brake defect ratios were not specifically relied on when developing any provision contained in the NPRM or in this final rule. Although power brake defect ratios were considered, they were not used as the basis for any of the provisions proposed in the NPRM or contained in this final rule. They were generally used to aid FRA in identifying problem areas, which in turn helped FRA identify brake issues and practices that needed to be addressed. For example, the existence of high power brake defect ratios at a particular location or on a particular railroad likely indicate the existence of certain practices or procedures that create or contribute to the high defect levels. As is evident from the discussions of the various requirements contained in both the NPRM and in this final rule, FRA considered a massive amount of information when developing this rule. These included accident/incident data; information and data provided in relation to the 1994 NPRM, the RSAC Power Brake Working Group, and the 1998 NPRM as well as FRA's experience in the enforcement of existing regulations and the expertise and knowledge of FRA's field inspectors.

Although the data regarding defect ratios contained in FRA's database has limited usefulness in the context of developing a regulation, the data is very useful to FRA in other ways. The data is useful in measuring a railroad's general compliance level and aids in identifying problem areas or locations. This information aids FRA in allocating its inspections forces and permits FRA to focus its enforcement on locations or issues which are in the greatest need of such scrutiny. By focusing its enforcement in this manner FRA is able to make the best use of its limited resources.

3. Discussion of Concerns Regarding FRA's Collection of Power Brake Defect Data

Although the NPRM and the preceding discussion detail the limitations of using the data collected by FRA regarding power brake defects when developing a regulation, FRA believes that a more detailed discussion of FRA's collection of power brake defect data is needed in order to address the issues raised by various commenters subsequent to the issuance of the NPRM. As noted above, FRA conducted a public meeting on May 27, 1999 in order to address general concerns raised by various parties regarding the accuracy of the brake defect data presented in the NPRM and to provide interested parties the opportunity to develop the issues they generally raised in oral and written comments regarding that data. At this public meeting, representatives of several labor organizations raised issues regarding the accuracy and use of the power brake defect data complied by FRA. These commenters generally allege that the method by which FRA collects defect data results in the underreporting of defects which in turn results in a systematic deflation of power brake defect ratios.

Specific issues raised at this public meeting and in subsequent written comments include: the overreporting of units inspected during FRA inspections; the calculation and deflation of the power brake defect ratio; the inspection procedures used by FRA that tend to exclude certain categories of power brake defects; potential discrepancies in the input data relative to the activity codes from FRA field inspection reports to FRA's database; the performance of power brake inspections by FRA inspectors on cars that are not properly charged or connected to a source of compressed air; FRA's reliance on the railroads for the total number of cars inspected; and the wide variance between FRA inspectors and FRA regions in the number of units inspected, the number of defects reported, and the resulting defect ratios.

In order to understand some of the issues raised, it is necessary to understand how inspection data developed by an FRA inspector are entered into FRA's database. FRA Motive Power & Equipment (MP&E) inspectors conduct inspections of railroad freight equipment pursuant to various parts of the Federal regulations contained in chapter 49 of the Code of Federal Regulations. Principally, these include inspections under the following: Part 215—Freight Car Safety Standards; part 229—Locomotive Safety Standards; part 231—Safety Appliance Standards; and part 232—Power Brakes and Drawbars. When performing an inspection under each of these parts, an FRA inspector will fill out the appropriate inspection form which indicates the number of units inspected under each part as well as the number of defective conditions found on those units. In the context of performing power brake inspections under part 232, an inspection of a car means a unit count of one. When this type of inspection is conducted, inspectors inspect various brake-related car components such as: Foundation brake rigging, air hoses, angle cocks, brake shoes, and, where possible, piston travel. When an inspector performs an inspection of a brake test required under part 232, the unit count for such a test

is the train consist, block of cars, or car being tested. For example, when an inspector observes the performance of an initial terminal brake test, the entire train would constitute one unit count.

Certain labor representatives raised various issues regarding FRA's calculation of power brake defect ratios. Several of these concerns involve the potential overreporting of the number of units inspected which then results in the deflation of power brake defect ratios. One concern addressed the practice of counting a single car or locomotive as a unit count under each of the MP&E regulations that it is inspected under. For example, a freight car could be considered a unit count under part 215, part 231, and part 232 if an FRA inspector were to inspect that freight car under each of those provisions. Thus, one freight car could be represented as three unit counts. It is claimed that this practice inflates the number of units inspected and thus, deflates defect ratios. This concern would be valid if FRA were to attempt to express a defect ratio for combined parts of the CFR. For example, if FRA were to attempt to express an MP&E defect ratio (a combination of parts 215, 229, 231, and 232) then the method by which FRA collects data would result in an inflation of the number of units inspected and the resulting defect ratio would be skewed. For purposes of analysis, FRA's database is constructed so that defect ratios are expressed only in terms of each separate part of the CFR. Therefore, the power brake defect ratios discussed in the NPRM were calculated based solely on the units inspected by FRA under the provisions contained in part 232.

A second concern involves the potential of duplicate inspection reports being submitted by different FRA inspectors when engaged in team inspections. Certain labor representatives allege that FRA inspectors are significantly inflating the number of power brake units being inspected by submitting duplicate reports for the same inspection activity when groups of FRA inspectors perform inspections at the same location. In an effort to investigate this concern, FRA designed a computer program to search for potentially duplicate inspection reports submitted during the years of 1995 through 1998. Table 2 displays the figures regarding power brake inspections conducted by FRA for the years of 1995 through 1998 that is contained in FRA's database.

TABLE 2.—POWER BRAKE INSPECTIONS AND DEFECT RATIOS: 1995 THROUGH 1998*

Calendar year	Power brake units	Power brake defective units	All railroads power brake defect ratios	Class I RRs power brake defect ratios
1995	611,824	24,387	.03986	.0369
1996	646,140	28,795	.04456	.0419
1997	582,685	26,004	.04463	.045
1998	585,663	26,286	.04488	N/A

*__Note__: Class I Railroads Power Brake Defect Ratios column information comes from the Regulatory Impact Analysis (RIA) for the 1998 NPRM on freight power brakes. No defect ratio was used in the report for calendar year 1998 because the RIA was finalized in August of 1998.

In order to identify potential duplicate reports the computer program identified inspection reports in which two or more FRA inspectors were in the same county, on the same day, on the same railroad, and in which at least one unit-count code matched. Table 3 displays the results of this search, showing the number of potential duplicate reports that were submitted from 1995 through 1998 and showing the potential number of over reported units.

TABLE 3.—POTENTIAL DUPLICATE POWER BRAKE INSPECTIONS 1995 THROUGH 1998

Calendar year	Inspection reports with more than one matching unit	Units	Potential duplicate units (half of units)
1995	39	1,965	983
1996	154	12,646	6,323
1997	342	19,482	9,741
1998	182	8,692	4,346

Table 4 and Table 5 display the impact of the potential duplicate reports on the calculation of power brake defect ratios. FRA believes that the data contained in Tables 4 and Table 5 establish that the impact of potential duplicate reports on the defect ratios presented in the NPRM is insignificant when considered in the context of nationwide data.

TABLE 4.—REVISED POWER BRAKE DATA CONSIDERING POTENTIAL DUPLICATE REPORTS 1995 THROUGH 1998

Calendar year	Power brake units	Potential duplicate units	Units minus potential duplicate units	Defective units	Defect ratios after adjusting for potential duplicate units
1995	611,824	983	610,841	24,387	.03992
1996	646,140	6,323	639,817	28,795	.04501
1997	582,685	9,741	572,944	26,004	.04539
1998	585,663	4,346	581,317	26,286	.04522

TABLE 5.—AFFECT OF POTENTIAL DUPLICATE REPORTS ON POWER BRAKE DEFECT RATIOS 1995 THROUGH 1998

Calendar year	Defect ratios before adjustment	Defect ratios after adjustment	Difference
1995	.03986	.03992	.00006
1996	.04456	.04501	.00045
1997	.04463	.04539	.00076
1998	.04488	.04522	.00034

It should be noted that the numbers presented in Tables 3 through Table 5 overstate the actual impact of potential duplicate inspection reports. For the year 1998, FRA conducted an in-depth analysis of the potential duplicate reports found by the computer program. The computer program identified 393 potential duplicate inspection reports for the year 1998. However, included in this grouping were unique inbound inspection reports, outbound inspection reports and split inspection reports. In addition, there were inspection reports from inspectors who worked in the same county, but at different locations. Each of these reports was removed from the 393 potentially duplicate inspection reports identified by the computer program based on a report-by-report analysis of each of the reports by FRA MP&E specialists. This analysis left 182 potential duplicate reports for 1998, which were used to calculate the figures presented in Tables 3 through 5 for 1998. Although these tables note 182 potential duplicate inspection reports involving 8,692 units (4,346 duplicates), a further analysis of the reports by FRA found that only 54 of the inspection reports were actually found to be duplicative. These 54 duplicate inspection reports involved the over-reporting of just 3,073 units rather than the 4,346 units identified in Table 4. As an in-depth analysis was not performed on the potential duplicate inspection reports identified by the computer program for the years of 1995 through 1997, the figures provided for those years in all likelihood greatly overstate the actual number of duplicate claims submitted in each of those years. Thus, the actual impact of duplicate inspection reports is even less than the small percentages indicated in Table 5 above.

Although the impact of duplicate inspection reports is insignificant, FRA believes that a brief discussion of how these duplicate inspection reports happened is necessary in order to assure interested parties that such occurrences are rare and that FRA has taken steps to avoid these inaccuracies. In 1994, FRA had four inspection forms for the Agency's five inspection disciplines. The Operating Practices and Hazardous Materials disciplines shared the same form. FRA also had a Quality Improvement Plan (QIP) daily activity report form to help the Agency track resource allocations, including the amount of time required to perform certain inspections. When ''team inspections'' occurred, one inspector completed the inspection report for the entire team. However, each inspector on the team was also required to complete a separate QIP report to receive credit for the inspection. On January 1, 1995, a newly developed single inspection form (FRA 6180.96) for all disciplines became operational. Furthermore, in May of 1995, FRA discontinued the collection of QIP-time data based on FRA's conclusion that it had adequate information from previous QIP reports regarding the time it takes to conduct various inspections. In addition, the new inspection form incorporated many of the previous QIP codes. In August 1995, FRA converted to a data collection system using personal computers.

After conducting the analysis discussed above, it was determined that 26 FRA MP&E inspectors inadvertently prepared all of the involved duplicate inspection reports. Furthermore, FRA was not aware that the new computer system did not filter out duplicate inspection reports. After becoming aware of these problems based on reports from its field personnel, FRA specifically addressed the issue of inspection reporting at FRA's multi-regional conference conducted in 1998. At this conference, FRA's Office of Safety management provided specific guidance on preparing reports that would eliminate potential duplicate reporting. During this same period, FRA also changed its computer software to give inspectors credit for inspections while at the same time preventing potential duplicate reporting. Furthermore, on March 5, 1999, FRA re-issued reporting procedures designed to prevent duplicate inspection reports when team inspections are conducted. These procedures were issued to all Federal and State inspection personnel and to all FRA Regional Administrators and Deputy Regional Administrators.

Subsequent to the public meeting conducted in May of 1999, FRA made two modifications to the summary data produced by its database in order to clarify the meaning of the data and to avoid misunderstanding by outside parties. The first modification relates to safety appliance inspections conducted under 49 CFR part 231. The summary data previously contained the heading ''SA & PB (cars and locomotives).'' This heading may have caused some confusion because the heading suggests that it applies to both safety appliance and power brake inspections when in reality the data captured under this heading only concerns safety appliance inspections under part 231. This heading has been modified to read ''SA (cars and locomotives)'' to more accurately reflect the information contained under this heading. FRA has also modified the summary data by eliminating the calculation of an MP&E defect ratio. As discussed above, FRA believes that the calculation of a composite MP&E defect ratio is inappropriate based on the way FRA collects the information contained in its database and would result in a deflation of MP&E defect ratios. Therefore, defect ratios will only be presented for each separate MP&E CFR part.

In response to the issue raised regarding FRA's practice of conducting brake inspections under part 232 while cars are not connected to a source of compressed air or not completely charged with air, FRA has developed a separate reporting code for brake inspections conducted in this manner. This reporting code will become effective in mid-2000 and will indicate when brake inspections are conducted on cars or trains that are not charged with compressed air. Although FRA agrees that the most thorough brake inspection is performed when a car or train is charged, a large majority of the brake components on a car can be inspected for abnormalities without the actual application of the air brakes. For example, cut-out air brakes, brake connection pins missing, brake rigging down or dragging, brake shoes worn to the extent that the backing plate comes in contact with the tread of the wheel,

angle cocks missing or broken, retainer valves broken or missing, and air brake piping bent or broken can all be discovered regardless of whether a car or train is charged with air. When FRA inspectors conduct train air brake tests, they inspect all of the components noted above as well as the operation of the train air brakes while under the required air pressures. FRA has conducted inspections of brake equipment in this manner for decades and will continue to conduct brake inspections under part 232 on equipment that is both on and off a source of compressed air. FRA believes that the addition of a code to identify those inspections conducted while equipment is not connected to a source of compressed air will provide a more accurate assessment of defective brake system components.

Two other issues raised by various individuals at the May 27, 1999, public meeting concerned FRA's reliance on railroads to determine the number of cars inspected and the wide disparity between FRA inspectors and regions with regard to the number of units inspected and defects reported. FRA acknowledges that FRA inspectors frequently rely on information provided by the railroad regarding car counts when initially conducting an inspection, which is sometimes higher than the actual number of cars being inspected. However, in most instances FRA inspectors request a copy of the consist prior to finalizing their inspection reports to ensure a proper unit count. FRA has issued guidance to its inspectors to ensure that the unit counts on all inspections are accurate.

Although FRA acknowledges that the number of brake inspections conducted varies somewhat from inspector to inspector and from region to region, FRA contends that these variances are the result of competing priorities and varying workloads within each region. FRA makes every effort to standardize its inspection activities by providing substantial training to each of its inspectors. This training is comprised of both classroom and on-the-job training. Classroom training conducted at least once a year at the Regional or Multi-Regional conferences, and through training provided by General Electric, General Motors-EMD, and Westinghouse Air Brake Company. Many regions also conduct discipline specific conferences with training on new regulations and issues provided by various subject matter experts. On-the-job training is provided through Regional Specialists and journeyman inspectors. These individuals will work one-on-one with the inspectors on the various types of inspections that the inspector is required to conduct. FRA also frequently issues enforcement guidance to its inspectors in the form of technical bulletins in order to ensure consistent enforcement of the regulations.

4. Review of Defect Data Submitted by the Brotherhood of Railway Carmen (BRC)

After issuance of the 1998 NPRM, FRA conducted a technical conference in Walnut Creek, California, on November 23 and 24, 1998. At this technical conference individuals representing the BRC submitted a vast amount of data collected either by its members at various locations or through joint labor and FRA inspection activities conducted at various locations. The data provided by BRC representatives addressed defective equipment found in various trains at seven different locations across the country during various time periods from October of 1997 to November of 1998. The BRC submitted this data in order to establish that the power brake defect ratios developed based on the information contained in FRA's database were inaccurate.

FRA conducted an in-depth review of the data submitted by BRC representatives. Although the BRC attempted to summarize the data for many of the locations addressed, FRA's review of the data discovered that the BRC's summaries counted defects that were not power brake defects, failed to summarize all the data for all the trains covered by the supporting documentation, and double counted some brake defects when calculating the number of defective cars. It should also be noted that approximately 80–90 percent of the defective conditions noted on the supporting documentation merely listed the defective condition as being ''brake shoes.'' This notation does not make clear whether the defective brake shoe was defective under the federal regulations or defective under AAR industry standards. However, in order to assess the data in a manner that is most favorable to the party submitting the data, FRA assumed that all defects noted as ''brake shoes'' were defective under Federal requirements. In conducting its analysis of the data submitted, FRA only considered power brake defects, whereas, BRC's summary data appear to consider other mechanical and safety appliance defects which are not the subject of this proceeding.

Table 6 contains a summary of FRA's in-depth analysis of the data submitted. FRA's analysis determined that the data submitted by the BRC establish a power brake defect ratio of approximately 4.96 percent, which is less than 1 percent higher than the power brake defect ratios developed based on the information contained in FRA's database for the years of 1996 and 1997, discussed in the 1998 NPRM. *See* 63 FR 48298. The analysis of the data submitted by the BRC indicates that some locations and some trains have power brake defect ratios in excess of 11 and 12 percent, which is consistent with the findings made and reported by FRA during various SACP inspections as noted in the preceding discussion and in the 1998 NPRM.

TABLE 6.—ANALYSIS OF DEFECT DATA SUBMITTED BY THE BRC

Location	Total trains inspected	Total cars inspected	Cars with power brake defect	Power brake defect ratio (percent)
North Platte, Nebraska	1,625	150,926	8,136	5.39
Hinkle Yard, Oregon	151	13,455	425	3.15
Oak Island-Newark, New Jersey	13	618	72	11.65
Kansas City, Missouri	180	11,917	159	1.33
Clovis, Alliance, Temple Yards—Texas	16	1,419	41	2.88
Sparks Yard—Sacramento, California	8	781	30	3.84
Various Locations, Mississippi	4	296	37	12.5
Totals	1,997	179,412	8,900	4.96

B. Inspection and Testing Requirements

As noted in the preceding discussions and in the 1998 NPRM, the issues related to the inspection and testing of the brake equipment on freight trains are some of the most complex and sensitive issues with which FRA deals on a daily basis. Consequently, the requirements related to the inspection and testing of freight power brakes must be viewed as the foundation on which the rest of the requirement contained in this final rule are based.

1. Brake Inspections—General

In the 1998 NPRM, FRA fully discussed the information and proposals submitted in response to the 1994 NPRM, as well as the proposals developed as part of the RSAC process. *See* 63 FR 48298–304 (September 9, 1998). Based on its review of that information and those proposals and based upon its experience in the enforcement of the current power brake regulations, FRA provided a detailed discussion as to why those alternatives were not viable models upon which a revision of the freight power brake requirements could be based. *See* 63 FR 48301–304. Rather than reiterate those discussions, FRA refers interested parties to the discussions contained in the 1998 NPRM noted above. In developing the inspection requirements contained in the NPRM, FRA determined that the proposed requirements should closely track the existing inspection requirements and intervals as they have proven themselves effective in ensuring the safety of railroad operations. FRA believed that moderate modifications to the existing requirements were necessary to ensure clarity, eliminate potential loopholes, incorporate current best practices of the industry, and enhance enforcement while providing some flexibility to the railroads to utilize new technologies and recognize contemporary railroad operations.

The current regulations are primarily designed around the following four different types of brake system inspections: Initial terminal; 1,000-mile; intermediate terminal; and brake pipe continuity check. *See* 49 CFR 232.12 and 232.13. These brake system inspections differ in complexity and detail based on the location of the train or on some event that affects the composition of the train. Each of the inspection provisions details specific actions that are to be performed and identifies the items that are to be observed by the person performing the inspection.

The initial terminal inspection described in § 232.12(c)–(j) is intended to be a comprehensive inspection of the brake equipment and is primarily required to be performed at the location where a train is originally assembled. This inspection requires the performance of a leakage test and an in-depth inspection of the brake equipment to ensure that it is properly secure and does not bind or foul. Piston travel must be checked during these inspections and must be adjusted to a specified length if found not to be within a certain range of movement. The brakes must also be inspected to ensure that they apply and release in response to a specified brake pipe reduction and increase. FRA recently issued enforcement guidance to its field inspectors clarifying that both sides of a car must be observed sometime during the inspection process in order to verify the condition of the brake equipment as required when performing an initial terminal inspection.

The current regulations require an intermediate brake inspection at points not more than 1,000 miles apart. These inspections are far more limited than the currently required initial terminal inspections in that the railroad is required only to determine that brake pipe leakage is not excessive, the brakes apply on each car, and the brake rigging is secure and does not bind or foul. *See* 49 CFR 232.12(b). In the 1982 revisions to the power brake rules, FRA extended the distance between these inspections from 500 miles to 1,000 miles.

The existing regulations also mandate the performance of an intermediate terminal brake inspection on all cars added to a train after it leaves its initial terminal, en route to its destination, unless they have been previously given an initial terminal inspection. This inspection requires the performance of a leakage test and verification that the brakes on each car added to the train and the rear car of the train apply and release. *See* 49 CFR 232.13(d). Railroads are permitted to use a gauge or device at the rear of the train to verify changes in brake pipe pressure in lieu of performing an application and release on the rear car. The current regulations also require that if cars that are given an intermediate terminal brake inspection and have not previously been provided an initial terminal inspection and are then added to a train, then the added cars must be given an initial terminal inspection at the next location where facilities are available for performing such an inspection.

The current regulations also require the performance of a brake pipe continuity test whenever minor changes to a train consist occur. This inspection requires that a brake pipe reduction be made and verification that the brakes on the rear car apply and release. Railroads are permitted to use a gauge or device at the rear of the train to verify changes in brake pipe pressure in lieu of visually verifying the rear car application and release. This inspection is to be performed when a locomotive or caboose is changed, when one or more consecutive cars are removed from the train, and when previously tested cars are added to a train.

In the 1998 NPRM, FRA noted that in its opinion railroads have not conducted the excellent initial terminal inspections that were contemplated in 1982, when FRA extended the 500-mile inspection interval to 1,000 miles. FRA also contended that many initial terminal brake inspections are being performed by individuals who are not sufficiently qualified or trained to perform the task. FRA recognized that since 1982 new technology and improved equipment have been developed that allow trains to operate for longer distances with fewer defects. However, the key to achieving this improved capability is to ensure the proper operation and condition of the equipment at the location where the train is initially assembled.

Although FRA agreed that many of the initial terminal inspections conducted by train crews are not of the quality anticipated in 1982 when the inspection interval was increased from 500 miles to 1,000 miles, FRA also conceded that properly trained and qualified train crew personnel can perform certain brake inspections and have been performing such inspections for many years. FRA stated that it did not believe that a reversion to a 500-mile inspection interval restriction on trains inspected by train crews, as sought by some commenters, would adequately address the concerns regarding the safety of those trains and would impose an economic burden on the railroads that could not be justified. In FRA's view, two of the major factors in ensuring the quality of brake inspections are the proper training of the persons performing the inspections and adequate enforcement of the requirements. Therefore, FRA proposed that the current 1,000-mile inspection interval be retained but that general training requirements for persons conducting brake inspections be established. The proposed training requirements included general provisions requiring both classroom and ''hands-on'' training, general testing requirements, and annual refresher training provisions. FRA also proposed that various training records be

maintained by the railroads in order for FRA to determine the basis for a railroad's determination that a particular person is qualified to perform a brake inspection, test, or repair. FRA believed that the proposed general training and recordkeeping requirements would provide some assurances that qualified people were conducting brake system inspections and tests. (See discussion below titled ''Training and Qualification of Personnel.'')

In addition to proposing general training requirements, FRA also noted its intent to enhance and increase its enforcement activities with regard to the performance of the brake inspections and tests eventually finalized in this rule, particularly those performed by train crews. FRA made clear that it would make a concerted effort to focus on the qualifications of train crew members and would strictly scrutinize the method and length of time spent by these individuals in the performance of the required inspections. FRA also committed to focus its inspection activities to ensure that train crews are provided the proper equipment necessary to perform many of the required inspections.

In addition to focusing its enforcement and to aid in that initiative, FRA proposed various clarifications, modernizations, and modifications of the current inspection requirements in order to close what are perceived to be existing loopholes and to incorporate what FRA believed to be the best practices existing in the industry while updating the requirements to recognize existing technology. FRA believed, and many representatives of rail labor and management agreed, that the current inspection requirements are very good for the most part and are sufficient to ensure a high level of safety, but that they need to be strictly enforced, clarified, and updated to recognize existing and new technology. Therefore, as noted above, FRA did not propose an extensive revision of the basic brake inspection intervals or requirements. Rather, FRA proposed a moderate revision of the requirements, with the intent of tightening, expanding, or clarifying those inspection or testing requirements that have created enforcement problems or inconsistencies in the past. FRA recognized some of the technological improvements made in the industry such as the use of two-way EOTs during the brake tests and use of the air flow method of qualifying train air brake systems. FRA also recognized that some trains are capable of moving extended distances between inspections provided that comprehensive inspections are performed at the locations where the trains are originated. (See discussion below titled ''Extended Haul Trains.'')

In order to clarify the requirements regarding where and when various brake inspections and tests were to be performed, FRA proposed modification of the terminology related to the power brake inspection and testing requirements contained in the current regulations, which is generally based on the locations where the inspections and tests must be performed (*e.g.,* ''initial terminal'' and ''intermediate terminal''). Instead, FRA proposed various ''classes'' of inspections based on the duties and type of inspection required, such as: Class I; Class IA; and Class II. This is similar to the approach taken by FRA in the 1994 NPRM and in the final rule on passenger equipment safety standards. *See* 64 FR 25682–83. FRA believed that this type of classification system would avoid some of the confusion that currently arises regarding when and where a certain brake inspection must be performed.

Currently, the brake system inspection and testing requirements are interspersed within §§ 232.12 and 232.13 and are not clearly delineated. Therefore, FRA proposed a reorganization of the major types of brake inspections into separate and distinct sections in order to provide the regulated community with a better understanding as to when and where each inspection or test would be required. Although FRA proposed a change in the terminology used to describe the various power brake inspections and tests, the requirements of these inspections and tests mirrored the current requirements and were not intended to change or modify any of the voluminous case law that had been developed over the years regarding the inspections. Consequently, FRA proposed four different types of brake inspections that were to be performed by freight railroads some time during the operation of the equipment. FRA proposed the terms ''Class I,'' ''Class IA,'' ''Class II,'' and ''Class III'' to identify the four major types of brake inspections required by this proposal.

The proposed Class I brake test, currently known as the ''initial terminal'' test, generally contained the requirements currently contained in § 232.12(a) and (c)–(j). *See* 63 FR 48362–63. The requirements were reorganized to clearly delineate when and how the inspection was to be performed based on current interpretations and comments received since the 1994 NPRM. The requirements were also modified to require written notification that the test was performed and that the notification was to be retained in the train until it reached its destination. The proposed revisions also acknowledged the use of the air flow method for qualifying train brake systems and permitted the use of end-of-train devices in the performance of the test. The proposal also provided some latitude to trains received in interchange that had a pre-tested car or solid block of cars added at the interchange point or that were to be moved less than 20 miles after being received in interchange by permitting these types of trains to continue without the performance of a comprehensive Class I brake test.

The proposed Class IA brake test clarified the requirements for performing 1,000-mile brake inspections currently contained in § 232.12(b). *See* 63 FR 48363. The proposal made clear that the most restrictive car or block of cars in the train would determine when the inspection was to be performed on the entire train. FRA also proposed that railroads designate the locations where these inspections would be conducted and did not permit a change in those designations without 30-day notice to FRA or the occurrence of an emergency situation. The proposed Class II and Class III brake tests essentially clarified the intermediate terminal inspection requirements currently contained in § 232.13(c) and (d) regarding the performance of brake system inspections when cars were added to the train en route or when the train consist was slightly altered en route. *See* 63 FR 48364.

In addition to the modifications and clarifications proposed with regard to the four major types of brake system inspections, FRA's proposal also retained, with clarification and elaboration, the basic inspection requirements related to transfer trains currently contained at § 232.13(e) as well as the requirements for performing brake system inspections using yard air sources currently contained at § 232.12(i). *See* 63 FR 48365. The proposal also retained the requirements related to the inspection and testing of locomotives when used in double heading and helper service currently contained at § 232.15 and proposed additional inspection requirements of locomotives when used in helper service or in distributed power operations to ensure the proper functioning of the brakes on these locomotives as these types of inspections are not adequately addressed in the existing regulation. *See* 63 FR 48365. Furthermore, the proposal recognized that trains, if properly inspected, could safely travel greater

than 1,000 miles between brake inspections. (See discussion below titled ''Extended Haul Trains.'')

FRA received numerous comments in response to the 1998 NPRM from representatives of rail labor and rail management, various private car owners, the NTSB, manufacturers of rail equipment, and one state public utility commission relating to these proposed provisions. These individuals and representatives submitted comments addressing the qualifications of individuals conducting the proposed inspections, the methods by which the proposed inspections are to be conducted, the frequency with which the proposed inspections should be required, and various other specific aspects of the language used in the proposed inspection requirements.

Several labor representatives objected to the proposed change in the names of the specific required inspections. These commenters believe that the proposed new terminology of Class I, Class IA, Class II, and Class III would result in a number of problems including confusion among those individuals responsible for performing the inspections as the existing terminology has been used for decades, imposition of additional training costs on the railroads as workers will need to be reeducated, and the risk of upsetting years of case law dealing with the various inspections.

Certain labor representatives also objected to the language used in connection to the proposed inspections that would permit a qualified person to perform many of the required inspections. Various labor organizations and their representatives reiterated their concerns that such an approach would continue to allow untrained and unqualified train crew personnel to perform the required inspections. These commenters continued to assert that FRA should mandate that carmen, or persons similarly trained and experienced, perform all of the required brake inspections except for the cursory train line continuity inspections covered by the proposed Class III brake test. It is their belief that only carmen possess the necessary training, skill, and experience to properly perform the other brake inspections contained in the proposal. These commenters contend that FRA is ignoring the commitment made by rail management in 1982, when the regulations were revised to permit trains to travel up to 1,000 miles between brake inspections, to conduct high quality inspections at a train's initial terminal. They contend that the 1982 revisions were intended to require that these brake inspections be performed only by carmen. Several labor representatives also contend that since the railroads have failed to live up to the commitment made in 1982, to conduct high quality initial terminal inspections, that FRA should reconsider its proposals to permit trains to travel 1,000 miles or more between brake inspections. These commenters recommended that FRA reduce the inspection interval to 500 miles.

Conversely, representatives of rail management and private car owners suggest that FRA failed to adequately consider the industry's safety record in proposing the inspection requirements. Several of these commenters recommended that FRA reconsider performance standards similar to those provided by the AAR in response to the 1994 NPRM. *See* 63 FR 48300. These individuals assert that based upon the industry's excellent safety record there is no need for the command and control type of regulations proposed in the 1998 NPRM. Several railroad representatives also commented that the proposed training requirements for designating an individual as a qualified person are onerous and not justified in light of the industry's safety record. They contend that the industry's safety record is evidence of the sufficiency of the training currently provided to its inspection forces. (See discussion below regarding the ''Training and Qualification of Personnel.'')

Many railroad and private car owner representatives also contend that there is no justification for continuance of the 1,000-mile inspection requirement. They contend that if a car is properly inspected at its point of origin it can be safely moved to destination and that very few cars are found defective at 1000-mile inspections. As support for these contentions, they cite to various studies, which included: a 1994 study conducted by the Illinois Institute of Technology Research Institute, which concluded that brake shoes could last up to 4,000 miles; a 1993 study conducted by BNSF at Havre, Montana, which found that less than ⅓ of 1 percent of the cars inspected at 1,000 miles had any kind of brake defect; and data submitted in 1985 by the AAR related to cars operating 3,000 miles between brake inspections. These commenters also rely on the fact that Canada eliminated its intermediate brake inspection requirement in 1994. Consequently, these commenters contend that the 1,000-mile inspection serves no useful purpose from a safety standpoint, creates unnecessary delays, and should be eliminated.

Commenters representing certain labor organizations also recommended that FRA establish step-by-step procedures for conducting the proposed inspections which specifically include a requirement that both sides of a train be given a walking inspection during both the set and the release of the brakes. These commenters contend that the language proposed in the 1998 NPRM regarding the inspection of both sides of a train is unclear and creates uncertainty as to how a proper inspection is to be conducted. They further recommend that roll-by inspections of the brake release not be permitted and that a walking inspection of the release be required. They also object to the proposed requirement permitting the use of an end-of-train device in lieu of a visual inspection of the pressure at the rear car in the train or in lieu of a set and release on such car as such a practice does not ensure actual application and release of that rear car.

Representatives of railroads and private car owners also believe that FRA should clarify the method by which certain inspections are to be performed. However, these commenters seek to clarify that both sides of the equipment do not have to be inspected during either the application or release of the brakes when conducting a Class I brake test and that both sides of the equipment do not have to be inspected when conducting Class IA brake tests. They contend that there is no reason to observe both sides of the equipment during either the set or release as long as the brake rigging and equipment is inspected to ensure it is in proper condition prior to or at the same time that the application or release of the brakes is conducted. If the brakes are applied or released on one side of the equipment then, due to the design of the equipment, the brakes on the other side of the equipment will be similarly applied or released in virtually every instance. Therefore, it is contended that there is no justification to require observation of the set and release from each side of the equipment. These commenters also contend that FRA needs to clarify that both sides of the equipment do not need to be observed during the performance of a Class IA inspection. They assert that such a requirement would be contrary to the current 1,000-mile inspection requirements and would increase the burden on railroads when conducting this inspection.

The CAPUC submitted comments on the proposed inspection requirements recommending that each side of the car be inspected during both the application and release of the brakes. This commenter also recommend that FRA

require the proposed Class I brake tests to be performed by individuals designated as ''qualified mechanical inspectors'' pursuant to the proposal. The CAPUC believes that only these individuals possess sufficient knowledge and ability to adequately perform the inspection. The NTSB also submitted comments on the proposed inspection requirements suggesting that FRA modify the requirements regarding the pressure at which trains are tested to require that trains be tested at the pressure at which they will be operated. The NTSB believes that such a requirement would preclude attempts to qualify trains that have excessive leakage by testing them at a pressure that is lower than the train's operating pressure and thus, lower the amount of leakage that exists on the train.

Some labor commenters again objected to FRA's inclusion of the air flow method as an alternative to the leakage test when qualifying a train's brake system. They contend that the air flow method disguises serious leaks and allows greater leakage in a train's brake system than the currently required leakage test. The AAR and other railroad representatives endorsed the allowance of the air flow method as an alternative to the leakage test for qualifying a train's brake system. They believe that the air flow method is superior to the leakage test and is an appropriate alternative for all trains, regardless of length, provided the 15 psi brake pipe gradient is maintained.

Certain labor representatives expressed concern over the proposed provision permitting yard air tests to be conducted at a pressure that is lower than the operating pressure of the train. These commenters suggested that such a practice could permit trains to depart with excess leakage since the required leakage test would be performed at the lower pressure and thus, mask the potential leakage of the train. The AAR and some of its member railroads also expressed concern regarding the proposed requirements related to the performance of brake tests using yard air. These commenters objected to the requirement that brake tests performed with yard air be performed at 80 psi. They recommended that such test be permitted to be performed at 60 psi as currently required because the proposal permits yard and transfer trains to operate at such pressure and that to test at higher pressure creates the potential for overcharge conditions. They also argue the practical difficulties of an 80 psi requirement in that many older yard plants and rental compressors are not capable of supplying 80 psi of air pressure. These commenters further contend that FRA should permit yard air to be connected to other than the front of the consist provided that procedures are taken to prevent overcharge conditions. The commenters also provided recommended language to clarify the calibration requirements for devices and gauges used to conduct yard air brake tests.

Several labor representatives also commented on the proposed written notification requirement related to the performance of Class I brake tests. These commenters supported the written notification requirement and recommended that the information remain with the train if the motive power is changed. One labor organization also recommended that the proposed requirements related to the designation of 1,000-mile inspections are insufficient. This commenter recommended that the designation be filed with FRA and that the designations specifically identify the trains that will be inspected at each location. Representatives of rail management objected to the proposed requirement that locomotive engineers be notified in writing by a person performing the test as to the successful completion of a Class I brake test. These commenters did not object to notifying the locomotive engineer of the results of the test but believe that the notification could be provided orally or electronically by a person with knowledge of the test as long as the locomotive engineer made a record of the notification and necessary information. These commenters also sought clarification of the proposed requirements regarding the designation of locations where 1,000-mile inspections would be conducted. These commenters did not object to the designation requirement provided that it is not required on a train by train basis. They contend that to require that specific trains have 1,000-mile inspections performed at specific locations would create substantial burdens and would eliminate flexibility needed to operate trains in a timely and efficient manner.

The AAR and other railroad commenters also raised concern over the requirement that trains in captive service be required to receive a Class I brake test every 3,000 miles. They recommended that a train of this type that travels in excess of 3,000 miles between cycles be permitted to complete its cycle prior to receiving a Class I brake test. They contend that to require a Class I brake test on these types of cycle trains on a 3,000 mile basis will require the reallocation of manpower and equipment to locations not currently equipped to perform such inspections.

Several railroad representatives also objected to the definition of ''solid block of cars'' contained in the proposal. This definition is important because FRA proposed that if more than a solid block of cars is removed from or added or a train, the entire train would have to receive a Class I brake test. As the proposed definition limits a ''solid block of cars'' to a group of cars that are removed from only one other train and that remain coupled together, these commenters contend that the definition is much more restrictive than the current interpretation of the language and would significantly increase the need to perform Class I brake tests. These commenters contend that the current interpretation of the language permits a ''solid block of cars'' to be made up of cars from several different trains provided the block of cars is added to a train as one unit without triggering the requirement to perform a new initial terminal brake test on the entire train. These commenters also noted that a literal reading of the proposed provisions for when a Class I brake test would be required does not allow a railroad to remove defective equipment without triggering a Class I brake test on the entire train. They contend that this authority needs to be recognized and is currently permitted.

FRA Conclusions. After consideration of the comments submitted and based upon its experience in the enforcement of the current power brake regulations, FRA continues to believe that the general approach to brake inspections contained in the 1998 NPRM represents the most effective method of ensuring the continued safety and proper operation of brake systems currently used in the railroad industry without creating an unnecessary burden to the railroads. Therefore, the final rule is a moderate revision of the current inspection requirements, similar to that proposed, with certain minor changes made to address the comments and recommendations submitted on the NPRM.

The final rule adopts the proposed classifications identifying the various types of brake inspections based on the duties and tasks that are required to be performed. These include: Class I; Class IA; Class II; and Class III brake tests. Contrary to the contentions of some commenters, FRA does not believe that this classification of the brake inspections in any way impacts previous case law regarding the various inspections. Although the final rule changes the terminology used to describe the various brake inspections,

the underlying inspection requirements have remained generally consistent with the existing requirements, and the final rule is not intended to change or modify any of the voluminous case law that has developed over the years regarding the inspections. Furthermore, the final rule retains the monikers that have traditionally been attached to the various inspections so as to limit any confusion that may exist. For example, the section containing the requirements for conducting Class I brake tests is entitled, ''Class I brake test-initial terminal inspection.'' FRA believes that the classifications proposed in the NPRM and retained in this final rule clearly delineate what is required at each inspection, better clarify when each inspection is to be performed, and avoid the potential confusion caused by the terminology used in the present regulations.

As discussed in detail in the 1998 NPRM, FRA continues to believe that the performance standard recommended by the AAR in response to the 1994 NPRM and suggested again by some commenters does not provide a viable method for establishing the frequency of brake inspections. *See* 63 FR 48301–02. The performance standard proposed by the AAR is based upon the number of mechanically-caused accidents per million train miles. Therefore, the standard is based upon the rate of occurrence of accidents—accident history—rather than on a factor that could measure a railroad's performance prior to an accident occurring. The suggested performance standard would also be very difficult to calculate on a railroad-by-railroad basis, and the standard itself is a very subjective factor as many accidents are due to a variety of causes only a part of which may be a mechanical or brake-related cause. Thus, the determination of what constitutes a mechanically-caused accident would be difficult if not impossible to make in some circumstances and would be a determination made by the railroad; thus, opening the potential for data manipulation. FRA also notes that the AAR's performance standard contains certain provisions that are contrary to existing statutory requirements regarding the movement of defective equipment.

The final rule retains the requirement to perform 1,000-mile brake inspections as proposed with a few minor revisions discussed below and in the section-by-section analysis of that section. Although FRA agrees that many of the initial terminal brake inspections currently conducted by train crews and other personnel are not of the quality anticipated in 1982, when the inspection interval was increased from 500 miles to 1,000 miles, FRA continues to believe that properly trained and qualified train crew personnel can perform most of the inspections required by this final rule and have been performing such inspections for many years. Furthermore, FRA continues to believe that a reversion to a 500-mile inspection interval on trains inspected by train crews, as suggested by some commenters, does not address the concerns regarding the safety of these trains and would impose an economic burden on the railroads that cannot be justified. Rather than simply increasing the frequency at which inspections are performed, FRA believes that the proper approach is to enhance the quality of the inspections being performed in order to further improve safety. FRA believes that the training and designation requirements contained in this final rule will increase the quality of the brake inspections being performed by ensuring that those individuals responsible for conducting the inspections are provided adequate and continuing training to properly perform the task. The final rule contains general training provisions which include: classroom and experiential ''hands-on'' training; general testing requirements; and periodic refresher training. The final rule also mandates that training records be maintained by the railroads in order for FRA to ascertain the basis for a railroad's determination that a particular person is considered qualified to perform the inspection or test he or she is assigned. FRA believes these training requirements will provide the necessary assurances that the people conducting the required inspections and tests are qualified.

FRA recognizes that since 1982 new technologies and improved equipment have been developed that allow trains to operate longer distances with fewer defects. The data submitted by AAR, noted above, appears to support this assertion, and FRA does not dispute the potential capability of certain equipment to travel distances in excess of 1,000 miles without becoming defective. However, the capability of the equipment to travel extended distances is contingent on the condition of the equipment when it begins operation and on the nature of the operation in which it is to be engaged. FRA believes that in order for brake equipment to travel extended distances between brake inspections, the condition and planned operation of the equipment must be thoroughly assessed at the beginning of a train's journey through high quality inspections. As noted above, FRA believes that railroads are not conducting high quality initial terminal inspections at many locations because the railroads are utilizing employees who are not sufficiently qualified or trained to perform the inspections. Therefore, FRA believes that the 1,000-mile brake inspection interval continues to be necessary and important to ensure the safe operation of trains inspected by qualified personnel pursuant to this final rule. Furthermore, no trains operated in the United States are currently permitted to travel greater than 1,000 miles between brake inspections. Consequently, FRA is not willing to permit trains to travel in excess of 1,000 miles between brake inspections, except in the limited, controlled situations where data on the equipment can be gathered. (See discussion below titled ''Extended Haul Trains.'') FRA notes that Canada eliminated intermediate inspections in 1994. However, Canada has different inspection requirements than those contained in this final rule and vastly different operating conditions and environments than those prevalent on most American railroads, operating conditions and environments that are more conducive to the inspection regimen imposed by that country.

The final rule also generally retains the proposed provisions detailing the items that must be inspected during the various inspections and the minimum procedures for performing the inspections. Contrary to the assertions of some commenters, FRA believes that the proposed methods of inspection sufficiently detailed how the various inspections were to be performed while providing flexibility for railroads to conduct the inspections in a manner most conducive to their operations. The methods of inspection proposed in the 1998 NPRM incorporated current practices and technical guidance previously issued by FRA. To require that all inspections be performed by walking the train would impose a huge financial and operational burden on the railroads and would ignore the various different methods by which inspections are currently performed and have been performed for years. FRA does not intend to mandate specific methods for how the various inspections are to be performed. FRA believes that each railroad is in the best position to determine the method of inspection that best suits its operations at different locations. FRA has never mandated specific step-by-step procedures for conducting brake inspections but

merely requires that, whichever method is used, it must ensure that all of the components required to be inspected will be so inspected.

The proposed rule made clear that when performing a Class I brake test of a train the inspector must take positions on each side of each car in the train sometime during the inspection process. This provision is retained in the final rule. This is intended to mean that at a minimum both sides of the equipment must be inspected. The provision does not require that both sides be observed during the application or during the release of the brakes. However, at a minimum at least one side of the car must be inspected while the brakes on the car are applied or if the brakes do not apply, while an effort is made to apply the brakes on the car. FRA continues to believe that if the various brake components are inspected to ensure they are properly secure and in proper condition then, due to the design of the equipment, if an application or release is observed from one side it can be assumed that in virtually every case there is an application or release of the brake occurring on the other side of the equipment. The final rule also retains the proposed requirement that the piston travel on each piece of the equipment must be inspected while the brakes are applied. Furthermore, the final rule retains the provision that permits a roll-by inspection of the release of the brake but prohibits the roll-by inspection from being considered an inspection of that side of the equipment.

FRA also finds the comments of AAR and other railroad representatives contending that both sides of the equipment should not be required to be inspected at Class IA brake tests to be lacking. The Class IA brake test basically incorporates the current 1,000-mile brake inspection, which FRA believes requires an inspection of both sides of the equipment during the inspection process. The current 1,000-mile inspection requires that brake rigging be inspected to ensure it is properly secure and does not bind or foul and that the brakes apply on each car in the train. *See* 49 CFR 232.12(b). In order to make these inspections properly, FRA believes that both sides of the equipment must be observed sometime during the inspection process and, to FRA's knowledge, railroads currently conduct these inspections in this manner. Thus, the NPRM and the final rule merely clarify what is required to be performed under the current regulations to properly perform a 1,000-mile inspection. Therefore, contrary to the contentions of certain commenters, retention of this current requirement does not impose any additional burden on the railroads.

The final rule retains the provisions granting railroads the ability to utilize the air flow method (AFM) to qualify a train's brake system in lieu of the traditional leakage test. FRA believes that if a train contains a locomotive equipped with 26L freight locomotive brake equipment and the train is equipped with an EOT device, that train should be allowed to be qualified using the AFM. The AFM of qualifying train air brake systems has been allowed in Canada as an alternative to the leakage test since 1984. In addition, several railroads in the United States have been using the AFM since 1989 when FRA granted the AAR's petition for a waiver of compliance to permit the AFM as an alternative to the leakage test. FRA recognizes the concerns of several labor organization commenters opposing the adoption of the AFM; however, FRA believes these commenters' apprehension is based on their unfamiliarity with the method. As FRA pointed out in the ANPRM, the 1994 NPRM, and the 1998 NPRM, the AFM is a much more comprehensive test than the leakage test. *See* 57 FR 62551, 59 FR 47682–47683, 63 FR 48305–06. The AFM tests the entire brake system just as it is used, with the pressure-maintaining feature cut in. FRA believes the AFM is an effective and reliable alternative method of qualifying train brakes. In the 1998 NPRM, FRA expressed some concern regarding the use of the AFM on short trains. However, based on consideration of the comments received and FRA's experiences in observing the use of the AFM, FRA agrees that the AFM should be permitted as an alternative on any train provided the 15 psi gradient is maintained on the train.

The final rule changes some of the provisions related to the conduct of brake tests utilizing yard air sources that were proposed in the NPRM. Rather than requiring yard air tests to be performed at 80 psi as was proposed, the final rule reduces the required pressure to 60 psi at the end of the consist as is currently required. FRA recognizes that many yard air sources and rental compressors are not capable of producing 80 psi of air pressure. However, to address the concerns raised regarding the inadequacy of conducting a leakage or air flow test at this lower pressure, the final rule includes provisions to require those tests to be conducted at the operating pressure of the train. Thus, if the yard air is not capable of producing the pressure that the final rule requires, then the leakage or air flow test is to be conducted when the locomotives are attached. The final rule also permits the yard air test device to be connected at other than the end of the consist nearest the controlling locomotive, provided that the railroad adopts and complies with written procedures to ensure that overcharge conditions do not occur. Many yards across the country currently conduct the test in this manner, and FRA believes it is necessary to acknowledge the viability of these operations.

The final rule also modifies the notification requirement related to Class I brake tests from that proposed in the NPRM. In the NPRM, FRA proposed that the engineer be informed in writing of the successful completion of the Class I brake test. The intent of this requirement was to ensure that the locomotive engineer was adequately informed of the results of the inspection; however, FRA recognizes that a requirement to provide the information in writing ignores technological advances and operational efficiencies. Consequently, the final rule will permit the notification in whatever format the railroad deems appropriate; provided that the notification contains the proper information and a record of the notification and the requisite information is maintained in the cab of the controlling locomotive. FRA believes these changes are consistent with the intent and purpose of the proposed requirement for written notification and ensure necessary information is relayed to the operator of the train.

FRA also realizes that the proposed requirement for designating locations where Class IA inspections will be performed was somewhat unclear and may have caused confusion. The intent of the requirement was to ensure that FRA was informed of those locations where a railroad intends to perform Class IA brake inspections and that FRA had the information with which to hold the railroad responsible for conducting the inspections at those locations. FRA was not intending to require that a railroad separately identify a specific Class IA inspection location for each train it operates. Consequently, the final rule makes clear that the designation required is for locations where such inspections will be performed and permits deviance from those locations only in emergency situations.

The final rule retains the proposed requirement that unit or cycle trains receive a Class I brake test every 3,000 miles. FRA has added a definition of ''unit train'' and ''cycle train'' to the final rule in order to clarify the applicability of the requirement.

Historically, these trains operate for extended periods of time with only a series of brake inspections similar to Class IA brake inspections. FRA believes that the proposed 3,000-mile limitation is appropriate as it represents the approximate distance that a train would cover when traveling from coast to coast. In addition the 3,000 mile requirement is consistent with the interval for performing Class IA brake tests and would equate to every third inspection being a Class I brake test rather than a Class IA brake test. Furthermore, AAR does not seek a moderate extension of a couple hundred miles so a few trains could complete their cycle, but seeks to extend the distance to more than 4,500 miles in many instances. FRA is not willing to modify the proposed requirement to that extent and believes that the 3,000-mile interval for these types of trains provides sufficient flexibility to the railroads to perform periodic Class I brake tests on these trains in a cost-efficient manner.

The definition of ''solid block of cars'' has been modified from that proposed in the NPRM. Although FRA believes the definition it proposed is consistent with current interpretations and enforcement of the requirement, FRA agrees with some of the commenters that the definition may have been too narrow and does not directly address FRA's primary concern, the block of cars itself. FRA's primary concern is the condition of the block of cars being added to the train especially when the block of cars is made up of cars from more than one train. Thus, the final rule will permit a solid block of cars to be added to a train without triggering a requirement to perform a Class I brake test on the entire train. However, depending on the make-up of that block of cars, certain inspections will have to be performed on that block of cars at the location where it is added to the train.

FRA believes that limits have to be placed on the addition of blocks of cars being added to a train in order to ensure that cars are being inspected in a timely manner and in accordance with the intent of the regulations. Some commenters suggest that a block of cars should be permitted to be added to a train with no inspection other than a continuity test regardless of the number of different trains the cars making up the block came from provided all the cars received a Class I brake test at their point of origin. Other commenters suggest that any number of blocks of cars should be permitted to be added to a train at a single location. FRA believes that to accept either of these positions would be tantamount to eliminating initial terminal and intermediate inspections and would drastically reduce the safety of freight trains being operated across the country. In FRA's view, both of the positions noted above are merely means to circumvent inspections and are akin to a practice known as ''block swapping'' in the mechanical inspection context, a practice that FRA does not permit. In FRA's opinion, the ability to add multiple blocks of cars to a train at one location or add a single block of cars to a train that is composed of cars from numerous different trains without inspecting the cars in those blocks, would essentially allow railroads to assemble new trains without performing any direct inspection of any of the cars in the train. Furthermore, if cars are permitted to be moved in and out of trains at will, the ability to track when and where Class IA brake tests are to be performed on trains will be impossible.

Based on a review of the comments submitted, two other minor modifications to the proposed inspection requirements have been made in this final rule. The final rule contains an additional caveat that will permit the removal of defective equipment at locations where other cars are added or removed without triggering the requirement to perform a Class I brake test on the entire train. FRA currently permits this practice, and it is consistent with the requirements aimed at having defective equipment repaired as quickly as possible. The final rule also modifies the language used in the proposed provisions related to the air pressure at which the brake tests are to be conducted based on a comment submitted by the NTSB. The NTSB noted that the language used by FRA in the NPRM to describe the air pressure settings for conducting the required brake tests would permit some road trains to be tested at a lower pressure than that at which the train would be operated. The NTSB contends that although most road freight trains operate at 90 psi, some road freight trains are operated at 100 psi and the proposal would permit them to be tested at 90 psi. FRA agrees with NTSB's suggestion that a trains brake system should be tested at the pressure at which the train will operate and has modified the language of the final rule accordingly.

2. Extended Haul Trains

In developing the provisions regarding extended haul trains proposed in the 1998 NPRM, FRA relied on several basic beliefs developed from the information and comments submitted and upon its experience in enforcing the current regulations. FRA believed that if a train was properly and thoroughly inspected, with as many defective conditions being eliminated as possible, then the train would be capable of traveling much more than 1,000 miles between brake inspections. By this, FRA contended that not only must the brake system be in quality condition but that the mechanical components of the equipment must be in equally prime condition. FRA believed that as the distance a train is allowed to travel increases, the mechanical condition of the equipment is a key factor in ensuring the proper and safe operation of the train brake system throughout the entire trip. FRA also stated that the best place to ensure the proper conduct of these inspections and to ensure that the train's brake system and mechanical components are in the best condition possible is at a train's point of origin (initial terminal).

In the 1994 NPRM, FRA proposed a set of requirements that had to be met by a railroad in order to move a train up to 1,500 miles without performing additional brake inspections. The requirements included such features as low defect ratios, maintenance programs, and the performance of quality brake and mechanical inspections at a train's point of origin. *See* 59 FR 47735. In the 1998 NPRM, FRA agreed with several commenters that some of the 1994 proposed requirements were overly burdensome and were partially predicated on potentially subjective standards. However, FRA continued to believe that many of the inspection requirements and movement restrictions proposed in 1994 were valid conditions that should be met in order to operate trains for extended distances between brake inspections. These included: the performance of a quality, in-depth brake inspection by a highly qualified inspector; the performance of a quality mechanical inspection by a person qualified under 49 CFR 215.11; and a restriction on the number of set-outs and pick-ups occurring en route. FRA also believed that these extended haul trains had to be closely monitored to ensure that both the brake system and mechanical components remain safely intact throughout the train's journey.

In the 1998 NPRM, FRA proposed that certain designated trains be permitted to move up to 1,500 miles between brake and mechanical inspections provided the railroad met various inspection and monitoring requirements. *See* 63 FR 48343, 48364–65. As no trains were currently permitted to travel in excess of 1,000 miles between inspections, FRA was not willing to propose more than

1,500 miles between such inspections until appropriate data is developed that establish that equipment moved under the proposed criteria remains in proper condition throughout the train's trip. FRA believed that the proposed provision requiring the performance of an inbound inspection at destination or at 1,500 miles and the requirement that carriers maintain records of all defective conditions discovered on these trains would create the bases for developing such data.

In order to ensure the accuracy of the data as well as ensure the proper and safe operation of these extended haul trains, FRA also proposed that the trains have 100 percent operative brakes and contain no cars with mechanical defects at their initial terminal point and at the time of departure from the 1,500-mile point, if moving an additional 1,500 miles from that location between brake inspections. FRA further proposed that these trains not conduct any pick-ups or set-outs en route, except for the removal of defective equipment, in order to minimize the disruptions made to the integrity of the train's brake system and reduce mechanical damage that might occur during switching operations. In addition, as there was no reliable tracking system currently available to FRA to ensure that cars added to the train en route have been inspected in accordance with the proposed requirements, FRA believed that the number of cars added to these trains had to be limited.

As noted earlier in the discussion, FRA believed that in order for a train to be permitted to travel 1,500 miles between inspections, the train must receive inspections that ensure the optimum condition of both the brake system and the mechanical components at the location where the train originates. In order to ensure that quality inspections were performed, FRA proposed that they be performed by highly qualified and experienced inspectors. As FRA intended that the proposed Class I brake test performed on these trains at their initial terminal be as in-depth and comprehensive as possible, FRA believed that the inspections should be performed by individuals possessing the knowledge not only to identify and detect a defective condition in all of the brake equipment required to be inspected, but also to possess the basic knowledge to recognize the interrelational workings of the equipment and the ability to trouble-shoot and repair the equipment. Therefore, FRA proposed the term ''qualified mechanical inspector'' to identify and describe those individuals it believed would possess the necessary knowledge and experience to perform the proposed Class I brake tests on these extended haul trains.

In the 1998 NPRM, a ''qualified mechanical inspector'' was defined as a person with training or instruction in the troubleshooting, inspection, testing, maintenance, or repair of the specific train brake systems the person is assigned responsibility and whose primary responsibilities include work generally consistent with those functions. (See § 232.5 of the section-by-section analysis for a more detailed discussion of ''qualified mechanical inspector.'') FRA also proposed that these same highly qualified inspectors be the type of individuals performing the proposed inbound inspection on these extended haul trains in order to ensure that all defective conditions are identified at the train's destination or 1,500-mile location. Similarly, FRA proposed that all of the mechanical inspections required to be performed on these trains be conducted by inspectors designated pursuant to 49 CFR 215.11 in order to ensure that all mechanical components are in proper condition prior to the train's departure.

The AAR and various private car owners submitted a number of comments objecting to the proposed requirements regarding extended haul trains contained in the 1998 NPRM. These commenters believe that the 1,500-mile limitation on the movement of these trains between brake inspections is insufficient considering the restrictions placed on the trains. They recommend that these trains be permitted to operate to its destination or at a minimum be permitted 2,000 miles between brake inspections. They contend that the 1,500-mile limitation results in little or no benefit to the railroads because in order to take advantage of the flexibility provided, railroads would have to establish new facilities and add more manpower at 1,500-mile points to conduct the more stringent inspections required at those locations. They contend that a limitation at the 2,000-mile point would be logically consistent with existing inspection requirements, based on 1,000-mile increments, and would allow a greater number of trains to utilize the provisions because railroads could use existing facilities and manpower. They recommend that FRA reconsider the estimates provided regarding the benefits derived from the extended haul train provisions, claiming that the benefits estimated in the NPRM's Regulatory Impact Analysis are overstated. Several private car owners also suggested that even if FRA were not to extend the proposed distance for the entire industry, it should allow certain private car owners greater distances due to their superior safety record and maintenance practices.

Many of these same commenters also object to the proposed requirement that extended haul trains not be permitted to make any pick-ups or set-outs en route. These commenters contend that this restriction severely limits the actual flexibility of the proposal. They assert that the prohibition on pick-ups and set-outs would eliminate nearly one-half of the trains that could potentially be operated under the proposed provisions. Several commenters also objected to the proposed notification requirements for extended haul trains. These commenters state that the proposed provision requiring advance notification to FRA of the trains to be operated under the extended haul provision would seriously limit the number of trains utilizing the provisions as many trains are unscheduled with unknown train symbols and would be excluded. They recommend that the notification requirements be reduced in some manner to allow unscheduled trains to be identified as extended haul trains. One commenter also objects to the proposed requirement that extended haul trains not depart their initial terminals with any part 215 defects entrained. This commenter asserts that there was no rationale for this restriction and that it merely creates an additional burden for railroads.

Several rail labor representatives also object to the proposed provisions permitting trains to be operated as extended haul trains; however, these commenters oppose allowing any train to operate more than 1,000 miles between brake inspections. These commenters contend that when the distance between intermediate brake inspections was increased in 1982, the railroads made a commitment to conduct quality initial terminal brake inspections in exchange for the increased mileage, but that has not occurred and FRA should not provide the railroads with an increase in mileage when the previous agreement has not been honored. They contend that the proposed extension would merely allow defective equipment to be moved further distances without repair. They further contend that the proposed increase in distance between brake tests is not justified from a safety standpoint and, thus, violates 49 U.S.C. 20302(d)(2), which permits a change in the existing power brake regulations ''only for the purpose of achieving safety.'' These commenters oppose any extension in the distance between brake inspections unless stringent

requirements are placed on the trains, one such requirement being that carmen or similarly trained individuals perform all the inspections and tests required to be performed on the trains. They also contend that the proposed standard for revoking a railroad's ability to designate extended haul trains is too high.

FRA Conclusions. FRA continues to believe that if a train is properly and thoroughly inspected, with as many defective conditions being eliminated as possible, then the train is capable of traveling much greater than 1,000 miles between brake inspections. Therefore, the final rule retains the provisions permitting railroads to designate trains as extended haul trains and allowing such trains to be operated up to 1,500 miles between brake inspections. Although FRA recognizes that retention of the 1,500-mile limitation may limit the utility of the provision on some railroads, FRA is not willing to increase the proposed mileage restriction at this time. Currently, no train is permitted to travel more than 1,000 miles without receiving an intermediate brake inspection. Therefore, FRA does not believe it would be prudent to immediately double or triple the currently allowed distance without evaluating the safety and operational effects of an incremental increase in the distance. Consequently, until sufficient information and data are collected on trains operating under the provisions proposed in the NPRM and retained in this final rule, FRA is not willing to permit trains to travel the distances suggested by some commenters without additional brake inspections. FRA continues to believe that the requirement for performing inbound inspections and the requirement to maintain records of all defective conditions discovered on these trains provides the basis for developing the information and data necessary to determine the viability of allowing greater distances between brake inspections.

After consideration of the comments submitted, FRA agrees that the benefits estimated in the NPRM in association with the extended haul provisions may have been overstated. FRA realizes that the retention of the 1,500-mile limitation may eliminate certain trains from being operated pursuant to the extended haul provisions and reduce the benefits estimated at the NPRM stage of the proceeding. (See detailed discussion in the Regulatory Impact Analysis portion of the preamble below.) However, in order to increase the viability of the extended haul provisions, the final rule provides some flexibility for designating extended haul trains and allows for the limited pick-up and set-out of equipment.

Several commenters noted that the proposed provisions regarding the advance designation of extended haul trains would prohibit certain unscheduled trains from being operated as extended haul trains. In an effort to provide some flexibility in this area, the final rule has been modified to allow railroads to designate certain locations as locations where extended haul trains will be initiated and requires railroads to describe those trains that will be so operated rather than requiring specific identification of every train. FRA believes this modification will allow railroads to capture some of their unscheduled trains by identifying the trains by the locations where they are initiated.

The final rule will also permit extended haul trains to set out cars at one location or to pick up cars, or both, at the same or another location. This modification will provide railroads the flexibility to set-out a block of cars at one location and pick up a block of cars at another location. FRA believes that this limited ability provides the railroads with some flexibility to move equipment efficiently while minimizing the disruptions made to the train's brake system and ensuring that cars added to such trains can be adequately tracked and inspected. The final rule makes clear that any cars added to extended haul trains must be inspected in the same manner as the cars at the train's initial terminal. The final rule also makes clear that any car removed from the train must be inspected in the same manner as a car at the train's point of destination or 1,500-mile location.

Certain commenters have portrayed the provisions related to extended haul trains as merely being an extension of the current intermediate inspection distances. FRA objects to such a characterization. In FRA's view, the extended haul provisions contained in the NPRM and retained in this final rule constitute a completely new inspection regimen. The provisions related to the operation of extended haul trains contain stringent inspection requirements, both brake and mechanical, by highly qualified inspectors and establish stringent requirements whenever cars are added to or removed from such trains. The extended haul train requirements also contain a means to assess the safety of such operations by requiring that records be maintained of the defective conditions that develop on these trains while en route. Consequently, FRA believes that the requirements related to extended haul trains not only ensure the safe operation of the trains operated under them, but actually increase the safety of such operations over that which is provided in the current regulations.

3. Charging of Air Brake System

Present regulations for air brake testing basically require that cars that have previously been tested in accordance with the regulations either ''be kept charged until road motive power is attached'' or be retested. *See* 49 CFR 232.12(i). The current regulations also require the performance of an initial terminal brake test ''where the train consist is changed other than by adding or removing a solid block of cars, and the train brake system remains charged. * * *'' *See* 49 CFR 232.12(a)(ii). Based on longstanding administrative interpretation and practice, FRA currently presumes that a brake system is no longer adequately charged if disconnected from the charging device (supply of pressurized air) for more than two hours before coupling or recoupling of locomotives; otherwise, retesting is required.

In the 1994 NPRM, FRA proposed to permit trains to be removed from a continuous source of compressed air for up to four hours without requiring the re-performance of a comprehensive brake inspection. FRA received very few comments that directly addressed the safety implications of this proposal; thus, FRA proposed the four-hour time limitation in the 1998 NPRM. In the 1998 NPRM, FRA agreed that its longstanding administrative interpretation, that requires the retesting of cars disconnected from a charging device for longer than two hours, was established prior to the development of new equipment that has greatly reduced leakage problems, such as welded brake piping and fittings and ferrule-clamped air hoses. However, contrary to several railroads' assertions, FRA did not believe that cars should be allowed to be off air for extended periods of time without being retested. FRA believed that the longer cars sit without air attached, the greater the chances were that the integrity of the brake system would be compromised. Consequently, based on today's equipment, operating practices, and overriding safety concerns, FRA proposed that cars should not be disconnected from a continuous supply of pressurized air for longer than four hours without being retested. FRA also proposed that the source of compressed air must be sufficient to maintain the integrity of the brake system. Consequently, FRA proposed that the source of compressed

air be maintained at a minimum level of 60 psi.

The AAR and several other parties commented that there is no reason to assume that once a train is charged and tested and then left standing without being provided with a source of compressed air that the brake system would become defective. These commenters assert that leaving equipment connected to a source of compressed air does nothing to ensure proper performance of the brake system, does not prevent vandalism, and does not prevent leakage due to adverse weather conditions. These parties suggest that leakage on standing trains has been greatly reduced through the use of welded brake piping and fittings and ferrule-clamped air hoses. These commenters believe that FRA's current interpretation of allowing trains to sit without air for only two hours is from an era when this new equipment was not used. They also contend that FRA's current interpretation and the proposed four-hour limitation costs the industry money, fuel, and time and creates pollution because trains must either be reinspected or left with a locomotive attached and idling in order to avoid performing a full Class I brake test. They further contend that the proposed four-hour rule exposes employees to various safety hazards due to the employees being required to perform inspections at locations that are not designed or equipped for such activity.

The AAR recommends that the proposed four-hour limitation be eliminated for the reasons noted above. They also noted that the Canadian rules do not contain an off-air requirement and that in Canada if cars are off air for any length of time, only a set-and-release continuity test is required. As an alternative to eliminating the off-air requirement completely, the AAR suggests that FRA adopt requirements which would allow cars to be removed from a source of compressed air for up to 48 hours without a car-by-car reinspection. They recommend that cars only be required to receive a continuity test when they have been off a source of compressed air for more than fours hours but less than 48 hours and that no retesting occur if equipment is off air for less than four hours.

Representatives of rail labor objected to the proposed increase in the amount of time that equipment could be removed from a source of compressed air. These commenters believe that the existing two-hour limitation is reasonable. Most of these commenters expressed concern for the integrity of the brake system if a consist were left standing for longer than two hours. These concerns were aimed at the effect that climate might have on the equipment and the increased possibility of vandalism to the equipment if consists or equipment were left off air for longer periods.

FRA Conclusions. The final rule retains the proposed requirement that equipment removed from a source of compressed air for longer than four hours be reinspected. FRA believes that this requirement is necessary to ensure not only the integrity of the brake system on equipment but to ensure that inspections are performed on equipment in a timely and predictable manner. FRA tends to agree that the amount of time equipment is left off a source of compressed air is not directly related to the operation of the brake system on that equipment. However, FRA does believe that in certain circumstances the length of time that equipment is removed from a source of compressed air can impact the integrity and operation of the brake system on a vehicle or train. Particularly in cold weather situations where freeze-ups in train brake systems can occur or in areas where the potential for vandalism is high due to the location where equipment is left standing. Moreover, FRA believes that the four-hour limitation is consistent with the intent of the existing regulations and is intended to ensure that equipment is regularly inspected.

The commenters objecting to the four-hour limitation proposed in the NPRM and retained in this final rule have ignored the intent and purpose of the existing two-hour allowance permitted by longstanding administrative interpretation. As discussed above, the existing power brake regulations, adopted by Congress in 1958, are based on the premise that if a train or equipment does not remain charged the equipment is to be retested. There is no provision in the existing regulations for allowing equipment to be removed from a source of compressed air for any length of time, such allowance was granted only through administrative interpretation. The original intent of the currently existing two-hour interpretation, which permits equipment to remain off-air for up to two-hours without being retested, was to allow trains to pick up or remove cars from their consists while en route without requiring a retest of the entire train. The two-hour limit was based on the amount of time it would take a train to make a switching move while en route. Thus, the current application of the two-hour rule to any and all equipment left off a source of compressed air is somewhat counter to the original intent of the interpretation when it was provided.

Although FRA recognizes that it has acquiesced and endorsed the expansion of the two-hour rule to all equipment, FRA believes that the underlying intent of the existing regulations must be recognized and maintained. The doubling of the existing two-hour interpretation to four hours is based on the fact that the average time needed for many trains to perform the switching they conduct while en route has increased. Thus, FRA's intent when proposing an expansion of the two-hour rule was not to alter the basic tenet that equipment should be retested when it is removed from a source of compressed air for any lengthy period of time. FRA believes that the four-hour allowance provided by this final rule gives the railroads flexibility to perform switching operations while trains are en route and provides flexibility to efficiently move cars from one train to another when necessary, yet retains the concept that equipment be retested when left disconnected from a source of compressed air for longer periods of time.

FRA further believes that a limitation on the amount of time that equipment may be off air is necessary for ensuring that equipment is inspected in a timely and predictable manner. If no time limit were imposed or if 48 hours were permitted, as suggested by some commenters, equipment could lawfully sit for days at various locations while en route to its destination and be switched in and out of numerous trains without ever being reinspected. Such an approach would drastically reduce the number of times that the brake systems on such equipment would ever be given a visual inspection from what is currently required and, in FRA's view, would seriously degrade the safety of the trains operating with such equipment in its consist. Furthermore, if equipment were allowed to be off-air for an excessive amount of time, it would be virtually impossible for FRA to ensure that equipment is being properly retested as it would be extremely difficult for FRA to determine how long a particular piece of equipment was disconnected from a source of compressed air. In order to make such a determination, FRA would have to maintain observation of the equipment for days at a time. Consequently, the final rule retains the proposed four-hour limit on the amount of time equipment can be disconnected from a source of compressed air as it maintains current levels of safety and provides an enforceable and verifiable time limit that FRA believes provides the railroads

some additional benefit over what is currently required both in terms of operational efficiency and cost savings.

4. Retesting of Brakes

In the 1998 NPRM, FRA attempted to clarify language contained in the current regulation which requires that the brakes ''apply.'' *See* 49 CFR 232.12(b), 232.12(d), 232.13(d), and 232.13(e). The current language has been misinterpreted by some to mean that if the piston applies in response to a command from a controlling locomotive or yard test device, and releases before the release signal is given, the brake system on that car is in compliance with the regulation because the brake simply applied. The intent of the regulation has always been that the brakes apply and remain applied until the release signal is initiated from the controlling locomotive or yard test device. Therefore, clarifying language was added to the proposed inspection requirements to eliminate all doubt as to what is required. In the 1998 NPRM, FRA made clear that the brakes on a car must remain applied until the appropriate release signal is given. The proposal required that cars with brakes that fail to remain applied either be removed from the train or repaired in the train and retested, and the proposal provided specific requirements for performing a retest on such equipment.

FRA recognized that some defective train air brake conditions found when performing a train air brake test, which may cause insufficient application of the brakes on a piece of equipment, are of such a nature that they can be quickly repaired in the train. For example, a brake connection pin might be missing, a slack adjuster might be disconnected, or some other minor part of the brake system might be defective. FRA realized that to mandate that equipment with these types of obvious defective conditions be removed from the train would potentially impose a tremendous burden on the railroads. Therefore, FRA sought to provide some relief to railroads by permitting cars with obvious brake defects to be repaired and retested while remaining in the train. However, FRA also believed that some consistency and guidance had to be provided regarding the performance of a retest on a car's brake system. Consequently, FRA proposed that the retesting of a car had to be conducted from the controlling locomotive or head end of the consist if a car is repaired in a train. Furthermore, FRA proposed that if a retest is conducted the brakes on the retested car must remain applied for a minimum of five (5) minutes. The proposed five-minute requirement was based on the leakage parameters established for locomotives contained at § 229.59(c).

The AAR and several other commenters object to the parameters contained in the proposed retesting provisions. Specifically, these commenters object to three of the requirements contained in the proposed retest provision, these include: the requirement that only cars with an obvious defect be retested, the requirement that the brakes remain applied for five minutes, and the requirement that the retest be conducted from the controlling locomotive or the head of the consist. These commenters contend that there is no reason to limit the retest provision to cars with readily identifiable defects. They claim that there are a number of conditions which might cause a car's brakes not to apply that are not readily identifiable thus, the retest may identify the problem and allow it to be repaired, or the reason for a no-set is unknown but the brakes operate properly upon being retested.

These commenters also believe that the proposed requirement to have the brakes remain applied for five minutes is impractical and unnecessary. They assert that it is only necessary to have the brakes remain applied for the period of time it takes an inspector to perform an inspection of the brakes and that it is impractical to require an employee to watch each retested car for five minutes. They also contend that FRA's reliance on the five-minute requirement related to the testing of locomotive brake cylinder leakage contained in § 229.59 is misplaced. They assert that there is no parallel between determining the brake cylinder leakage on a locomotive and the testing of the brakes on a freight car. One commenter suggests that a one-minute application is a sufficient period to ensure the proper operation of a car's brakes.

These commenters also object to the proposed requirement that the retest be conducted from the controlling locomotive or the head end of the consist. They contend that there is no safety hazard in performing the test with a test device positioned at one end of the car being retested. They assert that such a procedure would replicate the natural gradient of the train and, thus, avoid the possibility of overcharging the brake system, and would better facilitate retesting.

Representatives of rail labor generally supported the proposed retest provisions. These commenters did assert that any retest should be conducted from the head end of the consist or from the controlling locomotive. They claim that to perform the test from other than that location would provide no assurance that the brakes would apply in response to a brake pipe reduction from the controlling locomotive.

FRA Conclusions. FRA agrees that the proposed provisions regarding the retesting of cars may have been overly restrictive and is modifying the final rule based on FRA's review of the comments and recommendations submitted. The final rule has been modified to permit the retesting of any car the brakes of which were found not to be applied during a required inspection. FRA agrees that there are several circumstances that could occur where the reason for the failure of the brakes to apply is not readily apparent. FRA believes that permitting a retest on any car found not applying will not adversely affect safety since the car will be required to pass the retest in order to remain in the train or be handled for necessary repair.

The final rule also modifies the proposed provision that requires a retested car's brakes to remain applied for five minutes. FRA agrees that its reliance on the five-minute requirement applicable to the testing of locomotive brake cylinder leakage is not appropriate. However, rather than insert a subjective requirement for how long the brakes should remain applied, as suggested by some commenters, FRA believes that a definite time period should be established to ensure consistency in the performance of these retests. Thus, the final rule requires that the brakes on a retested car remain applied for at least three minutes. FRA believes that three minutes is consistent with the amount of time that it would take an individual to conduct a complete inspection of the retested car's brakes. The three minutes is based on the generally accepted period of one and one-half minutes it would take to perform a walking inspection on each side of an average size freight car. Requiring the brakes to remain applied for a period of at least three minutes also provides FRA with sufficient assurances that the brakes are operating properly and will remain applied for the duration of any brake application required during the train's journey.

The final rule also modifies the proposed requirement that the retest be conducted from the controlling locomotive or the head of the consist by permitting the retest to be conducted with a suitable test device positioned at one end of the car or cars being retested. FRA agrees that there is little or no safety rationale for requiring the retest to be performed from the controlling locomotive or head of the consist. Some

commenters argue that if the retest is not conducted from the controlling locomotive, then there are no assurances that the brakes will apply in response to a brake reduction from the controlling locomotive. FRA finds that this argument ignores the various methods by which cars may be tested and assembled when air brake tests are conducted using yard air sources. FRA currently allows and this final rule continues to allow cars to be tested with yard test plants and allows such cars to be added to trains without requiring that each car be inspected to ensure it operates in response to the controlling locomotive.

One potential safety hazard with allowing cars to be retested with a device at the car is the potential for injury to the employees responsible for separating the train line between the charged cars. The train line between the car being retested and the car it is coupled to would have to be separated to perform the retest with a device. In many cases this train line will be under pressure at the time of the separation and could cause injury to the person separating the train line if caution is not used. The final rule recognizes this potential safety concern and requires that the compressed air in a car to be retested must be depleted prior to separating the air hoses and conducting the retest.

C. Movement of Equipment With Defective Brakes

The current regulations do not contain requirements pertaining to the movement of equipment with defective power brakes. The movement of equipment with these types of defects is currently controlled by a specific statutory provision originally enacted in 1910, and later amended which states:

> (a) GENERAL.—A vehicle that is equipped in compliance with this chapter whose equipment becomes defective or insecure nevertheless may be moved when necessary to make repairs, without a penalty being imposed under section 21302 of this title, from the place at which the defect or insecurity was first discovered to the *nearest available place at which the repairs can be made*—
>
> (1) On the railroad line on which the defect or insecurity was discovered; or
>
> (2) At the option of a connecting railroad carrier, on the railroad line of the connecting carrier, if not farther than the place of repair described in clause (1) of this subsection.
>
> 49 U.S.C. 20303(a) (emphasis added).

Although there is no limit contained in 49 U.S.C. 20303 as to the number of cars with defective equipment that may be hauled in a train, FRA has a longstanding interpretation which requires that, at a minimum, 85 percent of the cars in a train have operative brakes. FRA bases this interpretation on another statutory requirement which permits a railroad to use a train only if ''at least 50 percent of the vehicles in the train are equipped with power or train brakes and the engineer is using the power or train brakes on those vehicles and on all other vehicles equipped with them that are associated with those vehicles in a train.'' 49 U.S.C. 20302(a)(5)(B). As originally enacted in 1903, section 20302 also granted the Interstate Commerce Commission (ICC) the authority to increase this percentage, and in 1910 the ICC issued an order increasing the minimum percentage to 85 percent. *See* 49 CFR 232.1, which codified the ICC order.

As virtually all freight cars are presently equipped with power brakes and are operated on an associated train line, the statutory requirement is in essence a requirement that 100 percent of the cars in a train have operative power brakes, unless being hauled for repairs pursuant to 49 U.S.C. 20303. Consequently, FRA currently requires that equipment with defective or inoperative air brakes makeup no more than 15 percent of the train and that if it is necessary to move the equipment from where the railroad first discovered it to be defective, the defective equipment be moved no farther than the nearest place on the railroad's line where the necessary repairs can be made or, at the option of the receiving carrier, to a location that is no farther than the location where the repairs could have been performed on the delivering line.

In addition to the general requirements relating to the movement of equipment with defective safety appliances, FRA currently requires 100-percent operative brakes on a train departing its initial terminal. The requirement for 100 percent at the initial terminal has been a standard by which the railroad industry has operated for decades and one which FRA and its predecessor agency, the Interstate Commerce Commission, have endorsed since the adoption of the power brake regulations. The requirement is founded on Congress' mandate that the ICC incorporate into the federal rail safety regulations the AAR's rules, standards, and instructions as of April 11, 1958, regarding the installation, inspection, maintenance, and repair of train brakes. In 1958, Congress amended a provision of the Safety Appliance Acts, then codified at 45 U.S.C. 9, by incorporating the inspection requirements of the AAR into the statute and permitting their change only for the purpose of achieving safety.[3] Based on a review of the legislative history surrounding that amendment, FRA believes it is clear that Congress interpreted the AAR standards as requiring 100 percent operative brakes on all trains prior to departure from an initial terminal. As the current regulations regarding the performance of an initial terminal inspection contained at 49 CFR 232.12(c)-(j) were basically an adoption of the AAR inspection and testing standards as they existed in 1958, FRA believes that the current regulations are intended and do require 100 percent operative brakes at initial terminals.

In developing the 1998 NPRM, FRA considered the various proposals discussed in the RSAC Working Group and the numerous comments provided subsequent to the issuance of the 1994 NPRM. A discussion of those comments and proposals was provided in the 1998 NPRM and will not be reiterated here. *See* 63 FR 48308–310. It is clear from that discussion that many of the proposals received by FRA since the issuance of the 1994 NPRM were in direct conflict with various statutory requirements related to the movement of equipment with defective brakes. As the RSAC Working Group was unable to reach a consensus on the inspection, testing, and maintenance requirements for freight train brake systems, FRA was not willing or able to propose provisions regarding the movement of equipment with defective brakes that would be contrary to existing statutory mandates. The 1998 NPRM contained proposals regarding the tagging of defective equipment, the placement of defective equipment in a train, and a method for consistently calculating the percentage of operative brakes on a train. Therefore, in addition to being consistent with the statutory requirements, the proposed requirements ensured the safe and proper movement of defective equipment and clarified the duties imposed on a railroad when moving such equipment.

FRA proposed that all cars or locomotives found with defective or inoperative brake equipment be tagged as bad ordered with a designation of the location where the necessary repairs

[3] In 1994, Congress revised, recodified, and enacted without substantive change, the federal railroad safety laws. Simultaneously, the then existing general and permanent federal railroad safety laws were repealed. 45 U.S.C. 9 of the Safety Appliance Acts is currently codified at 49 U.S.C. 20301 and 20302. The reference to the AAR rules, standards, and instructions was removed during the recodification as executed. *See* Pub. L. 103–272 (July 5, 1994) and H.R. Rep. No. 103–180, at 94 (1993).

would be effectuated. FRA attempted to expressly clarify the requirement that equipment with defective brakes not depart from, or be moved beyond, a location where the necessary repairs to the equipment could be performed. The 1998 proposal made clear that if a car or locomotive is found with defective brakes during any of the proposed brake inspections or while the piece of equipment is en route and the location where the defective equipment is discovered is a place where repairs of the type needed can be performed, then that car or locomotive may not be moved from that location until the necessary repairs are effectuated. However, if repairs to the defective condition cannot be performed at the location where the defect is discovered, or should have been discovered, the proposal made clear that the railroad is permitted to move the equipment with the defective condition only to the nearest location where the necessary repairs can be performed.

The preamble to the 1998 NPRM contained a lengthy discussion regarding FRA's views as to what constitutes the nearest location where the necessary repairs can be performed. *See* 63 FR 48309. In that discussion, FRA noted that its previous proposals regarding the use of mobile repair trucks and when locations serviced by those trucks would be considered locations where necessary repairs could be effectuated did not sufficiently address the issue and might lead to undesired consequences. Rather than attempt to develop a standard applicable to all situations, which FRA did not believe could be accomplished at the time, FRA intended to approach the issue of what constitutes the nearest location where necessary repairs could be made based on a case-by-case analysis of each situation. FRA noted that in making these determinations both the railroad as well as FRA's inspectors must conduct a multi-factor analysis based on the facts of each case. In the preamble, FRA provided a broad discussion, based on existing case law, setting out general guidelines and factors that should be considered when determining whether a particular location is a location where necessary repairs can be made or whether a location is the nearest location where the necessary repairs can be effectuated. *See* 63 FR 48309.

FRA also proposed continuation of the requirement to have 100 percent operative brakes on a train at its point of origin (initial terminal). FRA noted that this has been a requirement in the railroad industry for decades and that it was not only wise from a safety standpoint, as it ensures the proper operation of a train's brake system at least once during its life, but it also sets the proper tone for what FRA expects to be accomplished at these locations. Furthermore, requiring 100 percent operative brakes on a trains at its inception provides the railroads with a margin for failure of some brakes while the train is in transit (up to 15 percent) and tends to ensure that defective equipment is being repaired in a timely fashion. In addition, FRA stated that the 100-percent requirement is consistent not only with Congress' understanding of the AAR inspection standards that were adopted in 1958, but also with the intent of FRA, rail management, and rail labor as to what was to occur at initial terminals when the inspection interval was increased from 500 miles to 1,000 miles in 1982. At that time, carrier representatives committed to the performance of quality initial terminal inspections in exchange for an extension in the inspection interval, for which FRA intended to hold them accountable. Moreover, FRA believed that retention of the 100-percent requirement is consistent with the statutory requirements regarding the movement of defective equipment because a majority of the locations where trains are initiated have the capability of conducting virtually any brake system repair, and thus, under 49 U.S.C. 20303(a) the defective equipment may not be moved from those locations anyway.

In the preamble to the 1998 NPRM, FRA recognized that the 100-percent requirement at points of origin tends to be somewhat burdensome for some railroads at certain locations. *See* 63 FR 48309–10. However, FRA noted that the number of locations where the requirement is quite burdensome appears to be fairly low as FRA had made clear that railroads are free to petition for a waiver of this requirement, but as of the issuance of the NPRM no railroad had filed such a petition. Although FRA recognized that the requirement creates somewhat illogical scenarios at some locations, FRA was not willing to propose provisions permitting trains to depart locations with less than 100 percent operative brakes without fully considering the safety hazards or potential abuses which may accompany such an approach. Therefore, FRA sought comment from interested parties regarding the potential for permitting very limited flexibility in moving defective equipment from outlying initial terminals which lack the capability of effectuating brake system repairs. FRA also discussed various alternative approaches, with attendant restrictions, which might provide some flexibility at these outlying locations and sought comment on those approaches as well. *See* 63 FR 48310.

The AAR and several other railroad representative submitted a number of comments on the proposed requirements regarding the movement of defective equipment. The majority of the comments received from these parties addressed the proposed requirements regarding 100 percent operative brakes at a train's initial terminal, the identification of locations where brake repairs should be required, and the tagging of defective equipment.

These commenters recommend that FRA permit trains to operate from any location with a minimum percentage of its brakes inoperative. At a minimum, they recommend that this flexibility be provided at locations where repairs can not be performed. They suggest adoption of a 95-percent minimum operative brake requirement from such locations. They contend that the 100-percent requirement at initial terminals is outdated and does not take into consideration the numerous technological improvements made to brake systems over the last several decades. They also contend that it makes no sense to require 100-percent operative brakes on trains originating at a location yet allow a train originating at another location to pick-up defective equipment at the same location and haul it to the same place that it could have been hauled by the originating train. They further contend that the 100-percent requirement results in the unnecessary switching of cars and exposes employees to greater safety risks than if the equipment were permitted to depart in originating trains. Several commenters note that Canada has permitted trains to operate to destination with 95 percent operative brakes since June of 1994 and has experienced no compromise in safety. The AAR commented that railroads could live with a 95-percent operative brake requirement out of initial terminals provided that there were no mileage restrictions placed on the movement of such defective equipment as discussed in the NPRM. *See* 63 FR 48310. The ASLRA sought clarification as to the applicability of the 100-percent requirement to transfer trains. They contend that the language used in the NPRM suggests that all transfer trains must have 100-percent operative brakes from their initial terminal which is not what is required under the current regulations and would have a huge impact on small railroads.

A number of railroad representatives also provided comments and

recommendations on how FRA addressed the issue of what constitutes a location where brake repairs are required to be performed. These commenters recommend that FRA clarify what constitutes the nearest location where repairs can be made. These parties do not believe that this determination should be left to the discretion of individual FRA inspectors. They claim that such an approach creates inconsistent enforcement from one region to another and makes it very difficult for railroads to comply as FRA is continually second guessing their good faith determinations.

The AAR and other commenters contend that Congress intended that only fixed repair facilities be considered locations where brake system repairs must be conducted and that such facilities provide safer working conditions than those encountered when using a mobile repair truck. They further contend that it is not in the public interest to require repair trucks to make repairs at every location where they can be moved. The AAR and several railroads recommend that FRA permit railroads to designate repair locations to FRA and permit modification of those designations each quarter.

The AAR and its member railroads also objected to some to the proposed tagging requirements associated with the movement of equipment with defective brakes. They objected to the requirement that any automated tracking system be approved by FRA prior to its implementation. These commenters suggested that such review and approval process would be very time consuming and that FRA would not easily grant the use of such systems. They also objected to the proposed requirement that the tag or card be retained for 90 days, contending that the requirement was merely to aid in FRA's enforcement and served no other purpose.

The AAR also recommended that FRA modify the proposed requirement regarding the placement of equipment with defective brakes. The AAR contends that FRA should permit the use of multi-unit articulated equipment provided that it has no more than two consecutive control valves cut out or inoperative rather than the proposed limitation prohibiting the use of such equipment with consecutive inoperative or cut-out control valves. They contend this is the current practice of many railroads in the United States and is currently allowed on trains operated in Canada.

A number of rail labor representatives also provided comments on the proposed provisions regarding the movement of equipment with defective brakes. These commenters as well as the CAPUC support the requirement that trains have 100-percent operative brakes at their initial terminals. They believe that any flexibility granted to railroads in this regard would reduce the incentive to conduct quality inspections and would result in railroads eliminating even more personnel at other outlying locations. These commenters also suggest that any inability of railroads to conduct repairs at outlying locations is due to their own actions in eliminating repair equipment and personnel from these locations. They also contend that properly equipped mobile repair trucks have the capability of conducting any repair that would be required at virtually any of the outlying locations operated by a railroad.

Several labor representatives also object to granting the railroads the ability to designate locations where brake system repairs will be conducted. They contend that this is merely an attempt by the railroads to eliminate existing locations where repairs can be conducted. They further object to the AAR's contention that only fixed repair facilities should be considered in determining where brake system repairs must be conducted. They claim that such an approach would lead to the closure of even more fixed repair shops so that railroads could further circumvent the requirement to make timely repairs at the nearest location. They assert that allowing railroads to designate locations where repairs will be made would violate 49 U.S.C. 20303(a) which requires repairs to be conducted at the nearest location where the necessary repairs can be made.

Parties representing rail labor generally support the proposed tagging requirements for moving defective equipment but noted their objection to the use of an automated tracking system. These commenters believe that an automated tracking system reduces the awareness of ground inspection forces as to the presence of defective equipment and would not ensure proper handling of such equipment. The required tag provides carmen and yard crews with the ability to visually identify defective equipment and take appropriate action. Furthermore, it is contended that automated tracking systems lack ready accessibility and do not provide sufficient accountability or security to prevent potential abuse by the railroads. Many of these commenters also recommend that the tags be retained for a period of at least one year rather than the proposed 90 days and that they be made available to FRA immediately rather than within the proposed 15 days. Allowing railroads 15 days to produce the document would merely frustrate FRA enforcement activity due to information delay.

Several labor commenters as well as the CAPUC also recommend that FRA modify the proposed requirements regarding the person responsible for making the determinations regarding the movement of defective brake equipment. They suggest that the rule require the person to be a carman or at a minimum a person meeting the proposed definition of a qualified mechanical inspector. They contend that only these individuals have the experience and knowledge to adequately assess the impact that a defective piece of equipment might have on a train's operation.

Several labor representatives also raised concerns regarding the proposed method for calculating the percentage of operative brakes. These commenters along with the NTSB recommend that the proposed method for calculating the percentage of operative brakes, based on the number of cut-out control valves, be modified because a control valve can be cut in but the brakes which it controls can be inoperative. Thus, the proposed method does not provide an accurate count of the number of defective brakes. Some labor representatives suggest that the computation be based on car count as it provides a much more simple, reliable, and enforceable method than the proposed control-valve method. Certain labor representatives also object to the proposed list of conditions that would not be considered an inoperative brake for purposes of calculating the percentage of operative brakes. They contend that cars containing any of the listed conditions should be considered to have inoperative brakes.

FRA Conclusions. The final rule generally retains the requirements regarding the movement of defective equipment proposed in the 1998 NPRM with minor modification in response to the comments submitted. The final rule modifies the language used in the proposed general provisions to accurately reflect the language contained in the existing statutory provisions pertaining to the movement of equipment with defective brakes. The final rule replaces the term ''repair location'' with the phrase ''location where necessary repairs can be performed.'' FRA agrees that the proposed language could have been interpreted as being somewhat contrary to the language used in the existing statute, which was not FRA's intent.

The final rule also clarifies that the person required to make the determinations regarding the safe movement of defective equipment is to be a ''qualified person'' as defined in the final rule. The intent of FRA when issuing the NPRM was to require the determinations to be made by these individuals. FRA believes that the training requirements contained in the final rule for designating a person qualified to perform a specific task will ensure that the individual possesses the appropriate knowledge and skills to perform the assigned task. The determinations that are required to be made in the final rule are currently made by individuals which FRA believes will be trained and designated under the final rule as qualified persons.

The final rule also modifies the proposed method for calculating the percentage of operative brakes. The final rule retains the general method of calculating the percentage based on a control-valve basis. FRA believes that basing the calculation on control valves provides a much more accurate measurement than using a car basis because many types of freight equipment in use today can have the brakes cut out on a per-truck basis, and FRA expects this trend to continue as the technology is applied to new equipment. Thus, the method retained in this final rule more accurately reflects the true braking ability of a train as a whole and recognizes existing technology. However, FRA agrees with the comments of the NTSB and certain labor representatives that the method proposed in the NPRM did not take into consideration the possibility of a control valve being cut in when the brakes it controls are inoperative. Consequently, the final rule clarifies that a control valve will not be considered cut in if the brakes controlled by that valve are inoperative.

The final rule also retains the proposed list of conditions that are not to be considered inoperative power brakes for purposes of calculating the percentage of operative brakes. Contrary to the assertions of some commenters, the conditions listed do not render the brakes inoperative nor are the listed conditions ones that are outside the scope of the movement-for-repair provisions. Furthermore, many of the listed conditions are of such a nature that if found, they would constitute a violation under other provisions contained in the final rule and separate penalties are provided.

The final rule also modifies the proposed requirement regarding the placement of multi-unit articulated equipment with inoperative brakes. The final rule requires that such equipment shall not be placed in a train if it has more than two consecutive individual control valves cut out or if the brakes controlled by the valve are inoperative. FRA recognizes that the proposed requirement prohibiting the placement of such equipment with consecutive control valves cut out is more restrictive than current practice on many railroads. When proposing the requirement in the NPRM, FRA believed that the current practice on most railroads was to prohibit the placement of such equipment if it had consecutive control valves cut-out. Based on the comments received, it appears that the standard practice on most railroads prohibits placement of this equipment only if more than two consecutive control valves are cut-out. As it was FRA's intent to incorporate the current practices of railroads with regard to the placement of this equipment, the final rule has been modified accordingly.

The final rule retains FRA's position on the use of automated tracking systems in lieu of the required tagging of defective equipment. As an adequate automated system for tracking defective equipment does not currently exist on most railroads, FRA is not willing to permit the implementation of such a system without its approval. Furthermore, FRA does not believe it is prudent, from a safety perspective, to allow implementation of a tracking system for which FRA would not have a prior opportunity to assess to ensure the system's accessibility, security, and accuracy. Moreover, FRA agrees that the physical tagging of defective equipment provides a railroad's ground and operational forces the ability to visually locate and identify defective equipment at the time they see it rather than referring to an electronic database for such information. It should be noted that FRA is not intending to discourage the development of a viable automated tracking system, but believes that FRA must be provided the ability to review and approve any such system prior to its implementation. In fact, the final rule contains some new language regarding FRA's oversight of any automated tracking system that is approved by FRA to ensure the agency's ability to monitor such systems and potentially prohibit the use of the system if it is found deficient.

The final rule also retains the proposed requirement that a record or copy of each tag removed from a defective piece of equipment be retained for 90 days and made available to FRA within 15 days of request. FRA does not believe that the proposed time frames need to be expanded as suggested by some commenters. The provisions are identical to those contained in part 215 regarding freight car defects, and they have proven to be sufficient to meet the needs of FRA. FRA admits that the record keeping requirements are intended to aid FRA in its enforcement of the regulations. However, as the agency is able to inspect and oversee only a small portion of the railroad operations taking place across the country at any one time, the need for railroads to maintain records is essential for FRA carry out its mission of ensuring that all railroads are operating in the safest possible manner and comply with those regulatory provisions designed to ensure that safety.

After consideration of the comments provided, FRA believes it is essential to further clarify to the regulated community its position for determining whether a location is a place where brake repairs can be made. FRA does not agree that railroads should be permitted to unilaterally determine the locations FRA will consider capable of making brake system repairs. History shows that many railroads and FRA have widely different views on what should be considered a location where brake repairs can and should be effectuated. Furthermore, it is apparent to FRA that some railroads attempt to minimize or circumvent the requirements for conducting repairs for convenience or efficiency. However, FRA also recognizes that the emergence of mobile repair trucks creates an ability to perform repairs that did not exist when Congress enacted the statutory requirements related to the movement of defective equipment. FRA acknowledges that every location where a mobile repair truck is capable of making repairs should not be considered a location where repairs must be conducted. However, FRA also disagrees with the contentions of some commenters that Congress intended for only fixed repair facilities to be considered when determining locations where brake repairs are to be performed and that mobile repair trucks should not be considered. FRA is aware of numerous locations where mobile repair trucks are being used in lieu of a fixed facility or where a fixed facility was eliminated and the same repairs, that were being performed by the fixed facility, are now being performed at the same location by a fully equipped repair truck. Thus, FRA believes that locations where repair trucks are used in the same manner as a fixed facility should be considered when determining where the necessary repairs can be made.

As noted in the NPRM, the determination as to what constitutes the

nearest location where necessary repairs can be performed is an issue that FRA has grappled with for decades. FRA continues to believe that the determination must be made on a case-by-case basis after conducting a multi-factor analysis. However, in an effort to better detail the items that will be considered by FRA in making a determination, the final rule contains general guidelines that FRA will consider when determining whether a location is one where at least some brake system repairs must be made. FRA would expect railroads to consider the guidance contained in the final rule when making their decisions on where equipment containing brake defects will be repaired. The guidance contained in the final rule is based upon the voluminous case law that establishes the guiding principles for determining whether a location constitutes the nearest location where the necessary repairs can be made, previous enforcement actions taken, and guidance provided by FRA regarding identification of repair locations. The final rule guidance incorporates the principles contained in the following discussion previously set out in the NPRM.

In determining whether a particular location is a location where necessary repairs can be made or whether a location is the nearest repair location, the accessibility of the location and the ability to safely make the repairs at that location are the two overriding factors that must be considered in any analysis. These two factors have a multitude of sub-factors which must be considered, such as: the type of repair required; the safety of employees responsible for conducting the repairs; the safety of employees responsible for getting the equipment to or from a particular location; the switching operations necessary to effectuate the move; the railroad's recent history and current practice of making repairs (brake and non-brake) at a particular location; and relevant weather conditions. Although the distance to a repair location is a key factor, distance alone is not the determining factor concerning whether a particular location is the nearest location for purposes of effectuating repairs and must be considered in conjunction with the factors noted above. Existing case law states that neither the congestion of work at a particular location or convenience to the railroad are to be considered when conducting this analysis.

Although FRA does not believe that railroads should be permitted to unilaterally designate locations where brake system repair will be conducted, FRA does believe that safety could be served and disputes avoided if a railroad in cooperation with its employees could develop a plan, subject to FRA's approval, which designates locations where brake system repairs will be effectuated. FRA believes such a plan would have to be consistent with the guidelines discussed above and contained in this final rule and that such plans would have to be approved by FRA prior to being implemented. Such a plan could serve safety well by making clear to all where repairs are to be made and by assuring in advance that the criteria set forth in the final rule are appropriately applied. Consequently, the final rule permits railroads and representatives of their employees to submit a joint proposal containing a plan which designates locations where brake system repairs will be conducted. The final rule makes clear that such proposals would have to be approved by FRA prior to being implemented.

The final rule also retains the proposed and current requirement that a train have 100-percent operative brakes when departing from a location where an initial terminal brake test is required to be performed on the train. This has been a requirement in the railroad industry for decades, and FRA is not willing to provide an exception on an industry-wide basis at this time. Contrary to the assertions made by some commenters, FRA believes there is adequate justification for retaining the 100-percent requirement. In the NPRM and in the preceding discussion, FRA provided a number of reasons why it believes there is a need for the 100-percent requirement and will not reiterate them here. *See* 63 FR 48309. Some commenters suggested that FRA should permit any and all trains that have 95-percent operative brakes to operate from their points of origin to destination and that Canada currently allows such operation. FRA believes that such an approach would be completely contrary to, and would violate, the existing statutory mandate regarding the movement of equipment with defective brakes. The existing statutory provisions regarding the movement of equipment require that such equipment be repaired at the nearest location where the necessary repairs can be performed. *See* 49 U.S.C. 20303(a). Consequently, trains that originate at or that operate through locations where the necessary brake repairs can be effectuated clearly are required by the statute to have 100-percent operative brakes prior to departing those locations and may not haul a car with inoperative brakes under the statutory hauling-for-repair provision.

Although FRA recognizes that the 100-percent requirement may be somewhat burdensome for some railroads at certain locations, FRA believes that the number of locations involved is relatively low and should be handled on a case-by-case basis through the existing waiver process. FRA agrees that many railroads have created their own problems by eliminating repair facilities and personnel at many of the outlying locations where the railroads now claim they lack the ability to make appropriate repairs. Furthermore, FRA believes that the best method of assessing the safety implications of permitting a location to operate trains with less than 100-percent operative brakes is for the railroad to provide information on how the railroad will handle the defective equipment based on the specific needs and operating characteristics of the railroad involved.

In the NPRM, FRA provided various approaches under which it would potentially consider allowing a railroad to operate a train from their initial terminal with less than 100-percent operative brakes. *See* 63 FR 48310. The methods suggested by FRA were rejected as being overly burdensome by several commenters noted in the preceding discussion. Therefore, FRA believes the burden falls on each railroad seeking relief from the 100-percent requirement at certain outlying locations to provide FRA with an operating plan that will ensure the safe operation of such trains and provide for the timely and certain repair of any defective equipment moved from those locations. Consequently, FRA believes that there are a few existing locations that may be candidates for receiving a waiver from the 100-percent requirement, and FRA is willing to consider waivers for such locations, however; the railroads applying for such waivers must be able to establish a true need for the exemption and must be willing to provide alternative operating procedures that ensure the safety of the trains being operated from those locations.

The final rule also clarifies that the 100-percent operative brake requirement is not intended to apply to transfer trains that originate at location where the necessary brake repairs cannot be effectuated. FRA agrees that the 100-percent requirement does not currently apply to such trains, and it was not FRA's intention when issuing the NPRM to extend its application to such trains. However, it should be noted that if a transfer train originates at a location where repairs to the equipment

containing defective brakes can be effectuated, then the train would be required to have 100-percent operative brakes prior to departing that location.

D. Dynamic Brakes

The issue of dynamic brakes, and the extent to which FRA should impose regulatory requirements governing their use, if at all, is one which has prompted lengthy and animated debate among all affected parties since the issuance of the ANPRM in December 1992. Coincident with the drafting of the ANPRM, the Rail Safety Enforcement and Review Act amended section 202 of the Federal Railroad Safety Act of 1970 (recodified at 49 U.S.C. 20141), and mandated, in part, that FRA, ''where applicable, prescribe regulations that establish standards on dynamic braking equipment.'' This specific mandate is derived largely from two NTSB recommendations to FRA concerning dynamic brakes following the Southern Pacific Transportation Company (SP) accident at San Bernardino, California on May 25, 1989.

In this accident, excessive tonnage and excessive speed cresting a 2.2-percent grade, complicated by the fact that the train crew had been provided erroneous information regarding available and operative dynamic brakes, led to a train that was out of control and was ultimately unable to stop before derailing. While the NTSB determined the primary cause of the accident to be the excessive weight of the train as compared to that reported to the train crew, a secondary cause was determined to be the fact that the engineer had far less operable dynamic braking available for use than expected. The combination of these two conditions likely led to flawed decision making by the train crew in developing train handling strategies for negotiating the grade safely. In its final report, the Safety Board issued the following recommendations to the FRA regarding dynamic brakes:

1. Study, in conjunction with the AAR, the feasibility of developing a positive method to indicate to the operating engineer in the cab of the controlling locomotive unit the condition of the dynamic brakes on all units in the train.

2. Revise regulations to require that if a locomotive unit is equipped with dynamic brakes that the dynamic brakes function. NTSB Recommendation R–90–24 (1990).

To reiterate the general explanation of the principles of dynamic braking, as provided in the ANPRM (57 FR 62546), the 1994 NPRM (59 FR 47676), and the 1998 NPRM (63 FR 48311), dynamic brakes were developed as a ''free'' by-product of the diesel-electric drive train. By engaging the dynamic brake, the normally powered traction motors on each axle are changed to generators, and the power generated is dissipated through resistance grids. The effect is similar to that of shifting an automobile to a lower gear when descending a steep grade. The additional hardware needed to outfit a locomotive with dynamic brakes includes the grids and the controls and switches.

The primary selling point of dynamic brakes has been the ability to reduce freight car brake shoe wear. The dynamic brake is also useful in controlling train slack in lieu of using the locomotive independent brake. Furthermore, use of the dynamic brake in controlling train speed in lieu of power braking, where the train brake is applied with the locomotive under power, is a major factor in fuel savings. Due to these benefits, railroads currently emphasize and encourage the use of dynamic brakes as evidenced through examination of numerous carriers' operating rules which dictate the use of dynamic braking as the preferred method of slowing or controlling a train, or both, especially in heavy-grade territory. Historically, dynamic brakes have been applied to locomotives at the individual railroad's option, primarily based on economic considerations. It is important to note that, at present, the vast majority of new locomotives procured by the railroads are equipped with dynamic brakes.

A wealth of information was gathered regarding the operation, testing, and maintenance of dynamic brakes prior to the issuance of the 1998 NPRM. In the 1998 NPRM, FRA provided an in-depth discussion of the various proposals and comments related to the operation and maintenance of dynamic brakes as well as potential technologies for providing information to the locomotive engineer regarding the operational status of the dynamic brakes in a train consist. *See* 63 FR 48310–313. After consideration of all the information submitted and developed, FRA proposed a set of standards for dynamic brakes that it believed were consistent with the statutory mandate, took into consideration NTSB recommendations, promoted progressive improvements in dynamic brake information systems through the phased introduction of technology, while avoiding excessive regulation that might discourage the use of dynamic brakes.

In the 1998 NPRM, FRA noted that RSAC Working Group and task force deliberations provided no rationale to warrant a reconsideration of FRA's stated position that dynamic brakes do not offer the technical capability to serve as a primary train braking system since: (i) They provide braking force only on powered locomotive axles and are incapable of controlling in-train forces in the same manner as the automatic braking system; (ii) they are effective only within a narrow speed range and have no capability to actually stop a train; (iii) they can fail without prior warning; and (iv) their failure mode is characterized by loss of braking force (as opposed to the automatic brake, which, properly employed, initiates an emergency brake application upon loss of system integrity and therefore is failsafe). Similarly, however, FRA asserted that the RSAC Working Group and task force deliberations reinforced FRA's belief that dynamic brakes have become, *de facto,* a second-order safety system where employed. Although from the point of view of logical priorities, dynamic brakes ''back up'' the automatic train brake system, in sequence of operational procedures the priority is reversed. Stated differently, either the proper functioning of these systems, or the provision of reliable information concerning degraded functioning of these systems, should prevent locomotive engineers from operating trains in a manner that might make recovery through use of the automatic brake impossible.

In considering all of the information available, FRA concluded that it was imperative for the locomotive engineer to be informed in writing as to the operational status of the dynamic brakes on all locomotives in the consist at the initial terminal or point of origin for a train or at other locations where a locomotive engineer first takes charge of a train. Therefore, FRA proposed that locomotive engineers be provided this information at these locations. This proposed provision directly addressed the foremost concern articulated by the NTSB following the San Bernardino accident. FRA also proposed provisions requiring visible identification of locomotive units with inoperative dynamic brakes. FRA also agreed that when locomotives are equipped with dynamic brakes, they should be in proper operating condition and be maintained on a regular basis. Therefore, FRA proposed that defective dynamic brakes be repaired within 30 days of being found defective or at the locomotive's next periodic inspection. FRA recognized that these maintenance requirements might be overly burdensome in some instances for railroads (primarily short lines) that do not utilize dynamic brakes in their

respective operations, but yet own and operate locomotives equipped with dynamic brakes. Consequently, FRA proposed provisions for deactivating a locomotive's dynamic brakes without physically removing the components.

In addition to the information and maintenance requirements, FRA also proposed the development of operating rules and training programs to ensure the proper and safe use of dynamic brakes. For example, FRA proposed that railroads operating trains with brake systems that include dynamic brakes, develop and implement written operating rules governing safe train handling procedures for using these dynamic brakes under all operating conditions that are tailored to the specific equipment and territory of the railroad. The NPRM also proposed that the railroads provide training to their locomotive engineers on the prescribed operating rules, that at a minimum includes classroom, hands-on, and annual refresher training. More importantly, FRA also proposed a requirement that a railroad's operating rules be *based on the ability of friction brakes alone to safely stop the train under all operating conditions.* FRA believed that the establishment of these comprehensive operating rules and training plans was the most effective means by which to minimize the possibility of future incidents caused by excessive reliance on dynamic brakes by a train crew.

In the ANPRM (57 FR 62555), the 1994 NPRM (59 FR 47687), and the 1998 NPRM (63 FR 48314), FRA requested comments from the industry on possible methods of providing information regarding the status of dynamic brakes to the engineer in the cab of the controlling locomotive. The 1998 NPRM also contained a detailed discussion of various technologies available for providing information on the status of the dynamic brakes to the locomotive engineer. *See* 63 FR 48312–13. Although FRA recognized that the technology for dynamic brake displays with the ability to provide the type of information sought by FRA in the 1994 NPRM was not readily available at the time the 1998 NPRM was issued, several commenters suggested that the technology was under development. Consequently, FRA was not ready or willing to require the use of such indicators at that time. However, FRA noted that the benefit of such an indicator would be to alert engineers that they have diminished or excessive dynamic braking capabilities, thus permitting the engineers to control the braking of their trains in the safest possible manner. FRA indicated that it would continue to monitor the development of the technology and consider its application to locomotives used in the industry.

The AAR and its members, the NTSB, the CAPUC, and several representatives of rail labor provided numerous comments on the provisions related to dynamic brakes proposed in the 1998 NPRM. The AAR contends that the proposed requirement to provide written notification of the operational status of the dynamic brakes is overly burdensome. They recommend that the information be permitted to be transmitted in any manner, provided a record of the notification is maintained in the cab of the controlling locomotive. They also suggest that the notification only be required on an exception basis, when the dynamic brakes are inoperative. Conversely, representatives of rail labor contend that no locomotive with inoperative dynamic brakes should be permitted to be dispatched from a location with mechanical facilities capable of making the repairs. They further contend that if the locomotive's dynamic brakes cannot be repaired at the train's point of origin it should be allowed to be operated only as a trailing unit. These commenters support the requirement that the locomotive engineer be informed in writing as to the operational status of the dynamic brakes on all units in the consist and recommend that the lead locomotive of the consist be tagged to notify the engineer of the presence of a defective unit.

The AAR also objects to the proposed requirement that defective dynamic brakes be repaired within 30 days of being found defective. It claims that due to the reliability of dynamic brake systems they should be permitted to operate until the next periodic inspection. AAR asserts that a shorter repair cycle will reduce motive power availability and may result in shortages of motive power on some railroads. AAR also requests clarification of the term ''ineffective'' dynamic brake. The organization recommends that the term be eliminated, that the term ''inoperative'' dynamic brake be retained, and that a dynamic brake be considered ''inoperative'' when it is no longer capable of providing its designed retarding force on the train, similar to the proposed definition of ''effective'' brake.

Representatives of rail labor contend that locomotives with defective dynamic brakes should be required to be repaired within 15 days of being discovered. They contend that this is a more than sufficient time period for railroads to arrange for alternative power and get the locomotive to a location where it can be repaired. These commenters also recommend that a record of the repairs made to a locomotives dynamic brakes be retained for a period of one year rather than the 92 days proposed in the NPRM. These commenters also recommend that provisions be added to ensure that all dynamic brakes operate as intended and that the equipment not be altered or cut back in any manner.

The AAR also seeks clarification of the proposed training requirements contending that they should not be included in this rule unless FRA is willing to specify the knowledge, skills, and ability criteria needed pursuant to part 240. They also contend that the proposed requirement regarding the development of operating rules is unclear and should be eliminated if not clarified. The BLE asserted that the problem is not in the training of engineers on the use of dynamic brakes but in the prohibition on the use of the automatic brake in normal train operation, not just when the dynamic brakes fail. They assert that locomotive engineers should be permitted to use the automatic brake to control the train on a periodic basis to become familiar with its operation.

The AAR also objects to the requirement to stencil locomotives operating with deactivated dynamic brakes. The AAR asserts that defacing such locomotives is unnecessary and that a less intrusive means of identification should be used. The organization recommends that a locomotive with a deactivated dynamic brake should be treated no differently than a locomotive with an inoperative dynamic brake, in that the locomotive engineer should be notified of its presence. The AAR also recommends that railroads be permitted to use existing tags to identify locomotives with inoperative dynamic brakes.

The AAR and several locomotive manufacturers provided comments on the availability and use of dynamic brake indicators. These commenters make clear that there is currently no easy method of providing the available dynamic brake retarding force to the locomotive engineer. They also contend that the technology does not exist to show dynamic brake performance on distributed power units and that they should, therefore, be excluded from any indicator requirements. These commenters indicated that technology is not available to have most existing locomotives retrofitted with an indicator of some sort. They also assert that it is impossible to develop a device that will tell an engineer whether the dynamic

brakes will operate prior to the engineer actually applying the brakes due to the unknown risk of failure. The AAR also recommends that if FRA adopts an indicator requirement then the proposed requirements related to the notification of the locomotive engineer of dynamic brake status and for repairing inoperative dynamic brakes should not be adopted since real-time information will be available to the locomotive engineer.

Numerous labor representatives, the NTSB, and the CAPUC contend that the technology does exist, at least for new locomotives, to provide locomotive engineers with real-time indicators of the operating status of the dynamic brakes on trailing units. These commenters believe that the information these indicators provide to an engineer is extremely important and would allow engineers to control and operate their trains in the safest manner possible. All of these commenters appear to support a requirement to require these indicators in new locomotives, and some recommend some sort of retrofit requirement for existing equipment.

Several parties responded to FRA's request regarding technical reasons for prohibiting a locomotive with inoperative dynamic brakes from functioning as the lead or controlling locomotive in a locomotive consist. The AAR responded that it found no technical reason to prohibit such use, provided the locomotive has the ability to control the dynamic brakes on trailing locomotives. The AAR contends that railroads currently operate in this manner and will use a non-equipped locomotive when the other locomotives in the consist are cabless. Several labor representatives asserted that a locomotive with inoperative dynamic brakes should not be permitted to operate as the controlling locomotive regardless of whether it can operate the dynamic brakes on trailing units. These commenters contend that the engineer is better able to feel the dynamic brakes operate if the controlling unit has operative dynamic brakes and that the engineer will at least know whether that unit has operable dynamic brakes. The CAPUC cites similar human factor reasons for contending that a locomotive with inoperative dynamic brakes should not be used as a controlling unit. Several labor representatives also contended that if a defective locomotive were in the controlling position, then the speed of the train should be limited to 30 mph and the train should not be permitted to operate over grades of one percent or greater until a locomotive with operative dynamic brakes is placed in the lead position.

The NTSB and the CAPUC recommend that FRA include a ''mile-per-hour-overspeed-stop'' rule into the final rule to ensure that the speed of a train does not exceed its braking capacity. Such a rule would require a train that exceeds an established speed limit by a specified amount to be placed in emergency. The NTSB recommends that the overspeed limit be 5 mph or less over the designated speed limit. The CAPUC claims that California uses a 5 mph rule but that the limit may vary for different operations and should be established through validated simulations that include brake fade and field tests and must be related to a safe base speed. Both commenters contend that although the overspeed rule is simple, it accomplishes a critical safety function and reduces the chances of a runaway occurring as it removes any discretion from the operator. The CAPUC also recommends that railroads be required to validate their operating rules to ensure that friction brakes alone are sufficient to stop a train on all grades operated by the railroad. The CAPUC recommends that this be accomplished through validated simulations and field test that take into account brake heat-fade.

FRA Conclusions. The intent of the proposed requirement to notify the locomotive engineer in writing as to the operational status of the dynamic brakes on the locomotives in a train's consist was to ensure that the engineer had timely information on the condition of the locomotives so he could operate the train in the safest possible manner based upon that information. Thus, the manner in which the information is provided to the engineer is not a major concern to FRA, provided the information is accurate and up-to-date. Therefore, the final rule will allow railroads to provide locomotive engineers with the required information by any means they deem appropriate. However, the final rule will require that a written or electronic record of the information provided be maintained in the cab of the controlling locomotive. This will ensure that on-coming engineers will have the information provided to the previous operator of the train. The final rule also clarifies that the information is to be provided to the locomotive engineer at the train's initial terminal and at other locations where an engineer ''first begins operation'' of the train rather than where the engineer ''takes charge of the train.'' This clarification is in response to certain labor commenters to prevent possible misinterpretation or abuse of the requirement.

The final rule retains the proposed requirement to repair locomotives with inoperative dynamic brakes within 30 days of being found inoperative or at the locomotive's next periodic inspection, whichever occurs first. Due to the industry's reliance on these braking systems, as noted in the discussion above, FRA continues to believe they should be repaired as soon as possible after being found inoperative. FRA believes that a period of 30 days provides the railroads with sufficient time to get a locomotive to a location where the dynamic brakes can be repaired and allows for the reallocation of motive power when necessary so as to cause minimal disruption to a railroad's operation. FRA is not willing decrease the time period allowed to make repairs, as recommended by some commenters, because such a reduction could jeopardize a railroad's access to available motive power and could cause delay in the movement of freight which may create safety hazards themselves.

The final rule also eliminates the use of the term ''ineffective'' dynamic brakes and uses the term ''inoperative'' dynamic brake to include any dynamic brake that no longer provides its designed retarding force on the train, for whatever reason. FRA agrees that the use of only this term clarifies the applicability of the requirements related to dynamic brakes and prevents potential misunderstandings. The final rule also retains the proposed requirements related to the tagging of a locomotive found with inoperative dynamic brakes. Contrary to the comments of some parties, FRA does not believe that the tagging provisions require the development of new tags. The rule would allow the use of any type of tag, provided it is placed in a conspicuous location and contains the required information. The final rule also eliminates the requirement to stencil the outside of a locomotive declared to have deactivated dynamic brakes. FRA agrees that defacing the exterior of the locomotive is unnecessary and would do little to inform the locomotive engineer of the presence of the locomotive. FRA believes that the requirements to notify the locomotive engineer of the operational status of the locomotives and to have the cab of the locomotive clearly marked that the locomotive's dynamic brakes are deactivated provide sufficient notice to the locomotive engineer as to the status of that locomotive.

The final rule contains a requirement that an electronic or written record of repairs made to a locomotive's dynamic brakes be maintained and retained for a period of 92 days. Although this

requirement was not proposed in the NPRM, FRA believes these records fall within the scope of the notice and are necessary to ensure that necessary repairs are conducted on a locomotive's dynamic brakes in a timely fashion. FRA also believes that such a record will provide a railroad with information regarding the operation of the dynamic brakes and will potentially permit railroads to identify a repeated problem with a locomotive's dynamic brakes to prevent future reoccurrences and, thus, increase the utilization of a locomotive's dynamic brakes.

The final rule also contains specific requirements related to the use of a locomotive with inoperative or deactivated dynamic brakes as a controlling locomotive. These requirements are based on FRA's review of the comments submitted in response to FRA's request regarding the positioning of such a locomotive made in the NPRM. *See* 63 FR 48314. FRA tends to agree that there are no technical reasons why a locomotive with inoperative dynamic brakes cannot function as the controlling locomotive provided it can control the dynamic brakes on trailing units in the locomotive consist. However, FRA also agrees that a locomotive engineer loses the physical sensation of the operation of the dynamic brakes when the unit where the engineer is riding loses dynamic brake capability, which, if present, provides the engineer with at least some assurance that the dynamic brakes on some of the units in the consist are operating. Thus, in addition to requiring that locomotives with inoperative or deactivated dynamic brakes have the capability of controlling the dynamic brakes on trailing units when operating as the controlling locomotive, the final rule also requires that such locomotives also have the capability of displaying to the locomotive engineer the deceleration rate of the train or the total train dynamic brake retarding force. This requirement will ensure that locomotive engineers have at least some information as to the operation of the dynamic brakes in the locomotive consist they are controlling. FRA intends that the information required by this provision be provided either by a device known as an ''accelerometer'' or a similar device or by a dynamic brake indicator capable of providing total train dynamic brake retarding force to the locomotive engineer.

The final rule also contains provisions requiring new and rebuilt locomotives to be equipped with some sort of dynamic brake indicator. Although FRA agrees that the technology does not currently exist to equip existing locomotives with dynamic brake indicators economically, FRA does believe that the technology exists or is sufficiently developed to provide new locomotives with the ability to test the electrical integrity of the dynamic brakes at rest and to display the total train dynamic brake retarding force at various speed increments in the cab of the controlling locomotive. FRA recognizes that the industry will require a little time to incorporate the existing technology into new locomotives. Therefore, the requirements related to dynamic brake indicators will only apply to locomotives ordered one and one-half years after the issuance of this final rule and to locomotives placed in service for the first time three years after the effective date of the final rule. FRA also recognizes that not all locomotives being rebuilt are designed, or have the capability of being redesigned, to have the capability to display the total train dynamic brake retarding force in the cab of the controlling locomotive. Thus, the final rule allows rebuilt locomotives to be designed to display the train deceleration rate (i.e., equipped with an accelerometer or similar device as discussed above) in lieu of being equipped with the dynamic brake indicator required on new locomotives. FRA believes that the information provided by these indicators is extremely useful to an engineer and will provide locomotive engineers with ready access to real-time information on the operation of the dynamic brakes in a locomotive consist and permit engineers to control and operate trains in the safest manner possible.

FRA also acknowledges that the information provided by dynamic brake indicators would eliminate the need to provide the locomotive engineers with information regarding the operational status of the dynamic brakes when the engineer first begins operation of a train. As the indicators would provide real-time information to the engineer on the operation of the dynamic brakes brake in the train consist, the information received by the engine when beginning operation would be unnecessary. Therefore, the final rule alleviates the need to inform locomotive engineers of the status of the dynamic brakes when all of the locomotives in the lead consist are equipped with dynamic brake indicators required for new locomotives. FRA believes that this allowance makes sense from a practical perspective but also provides some incentive for railroads to equip existing equipment with such indicators when the technology for doing so becomes economically feasible. It should be noted that there is no requirement that the dynamic brake status of distributed power units be provided in order to eliminate the need to provide dynamic brake information to the engineer. FRA agrees that the technology for transmitting that information to the engineer is not currently available in a cost effective and reliable manner.

The final rule retains the proposed provisions requiring railroads to develop and implement written operating rules governing the use of dynamic brakes and to incorporate training on those operating rules into the locomotive engineer certification program pursuant to 49 CFR part 240. Contrary to the assertions of some commenters, FRA does not believe these requirements are unclear. FRA intends for each railroad to develop appropriate operating rules regarding train handling procedures when utilizing dynamic brakes that cover the equipment and territory operated by the railroad. Many railroads already have these procedures in place and already provide training to their employees that adequately cover the requirements. FRA continues to believe that training on proper train handling procedures is essential to ensuring that locomotive engineers can properly handle their trains with or without dynamic brakes and in the event that these brake systems fail while the train is being operated. FRA also disagrees that the agency should specify the knowledge, skill, and ability criteria that a railroad must incorporate in its training program. FRA believes that each railroad is in the best position to determine what these criteria should be, given the railroad's equipment, physical characteristics and operating rules, and what training is necessary to provide that knowledge, skill, and ability to its employees.

The final rule also requires that the operating rules developed by railroads include a ''miles-per-hour-overspeed-stop'' requirement that requires a train to be immediately stopped if it exceeds the maximum authorized speed by more than 5 mph when descending a grade of one percent or greater. FRA agrees with both the NTSB and the CAPUC that this requirement accomplishes a critical safety function and reduces the potential for a runaway train as it establishes a clear rule for stopping a train and removes any discretion from the operator to continue operation of a train. FRA believes that the five-mph limitation is a good base limitation that should be reduced if so indicated by validated research and should be increased only with FRA approval. Moreover, the operating rules of most

Class I railroads already include a five-mph-overspeed-stop provision; thus, FRA's inclusion of the requirement in this final rule should impose little or no burden on the operations of most railroads.

E. Training and Qualifications of Personnel

Currently, the regulations contain no specific training requirements or standards for personnel who conduct brake system inspections. The regulations merely require that a ''qualified person'' perform certain inspections or tasks. *See* 49 CFR 232.12(a). Furthermore, the current regulations do not require that a railroad maintain any type of records or information regarding the training or instruction it provides to its employees to ensure that they are capable of performing the brake inspections or tests for which they are assigned responsibility. In several cases, FRA has found that a railroad's list of ''qualified persons'' is merely a roster of all of its operating and mechanical forces.

In the 1994 NPRM, FRA proposed a series of broad qualification standards addressing various types of personnel engaged in the inspection, testing, and maintenance of brake equipment. *See* 59 FR 47731–47732. These broad qualifications were separated into distinct subgroups that identified various types of personnel based on the type of work those individuals would be required to perform under the proposal. These included supervisors, train crew members, mechanical inspectors, and electronic inspectors. Although not proposed in the rule text of the 1994 NPRM, the preamble contained various guidelines regarding specific hours of classroom and ''hands-on'' training as well as guidelines regard the level of experience each of these types of employees would be required to possess or be provided. *See* 59 FR 47702–47703. The proposal also contained various requirements regarding the development and retention of records and information used by a railroad in determining the qualifications of such employees. See 59 FR 47732.

In the 1998 NPRM, FRA acknowledged that many railroads continue to improve the training they provide to individuals charged with performing brake system inspections, tests, and maintenance; however, FRA also acknowledged that it continued to believe that this training could be greatly improved and enhanced. The agency noted that although there had been a decline in the number of train incidents, derailments, fatalities, and injuries over the previous ten years, FRA believed that the number of these incidents could be further reduced if maintenance, inspections, and tests of the brake system were performed by individuals who have received proper training specifically targeting the activities for which the individual is assigned responsibility. FRA believed that one of the major factors in ensuring the quality of brake inspections and the proper operation of that equipment is the adequate training of those persons responsible for inspecting and maintaining that equipment.

In the 1998 NPRM, FRA proposed broad performance-based training and qualification requirements that would permit a railroad to develop programs specifically tailored to the type of equipment it operates and the employees designated by the railroad to perform the inspection, testing, and maintenance duties required in this proposal. FRA agreed that there is no reason for an individual who solely performs pre-departure air brake tests and inspections to be as highly trained as a carman since a carman performs many other duties which involve the maintenance and repair of equipment in addition to brake inspections. Therefore, FRA proposed training and qualification requirements which permit a railroad to tailor its training programs to ensure the capability of its employees to perform the tasks to which they are assigned. FRA also made clear that the proposed training and qualification requirements applied not only to railroad personnel but also to the personnel of railroad contractors and personnel in plants that build cars and locomotives that are responsible for brake system inspections, maintenance, or tests covered by this part.

Contrary to the 1994 NPRM, FRA did not issue specific guidelines on experience, classroom training, or ''hands-on'' training. FRA agreed that many of the guidelines contained in the preamble to that proposal were overly restrictive and might have impeded the implementation of certain training protocols capable of achieving similar results with less emphasis on solely the time spent in the training process. Furthermore, the 1994 proposed guidelines failed to consider the potentially narrow scope of training that might be required for some employees, particularly some train crew personnel, that perform very limited inspection functions on very limited types of equipment. Consequently, although the training and qualification requirements proposed in the 1998 NPRM continued to require that any training provided include classroom and ''hands-on'' training as well as verbal or written examinations and ''hands-on'' proficiency, they did not mandate a specific number of hours that the training must encompass as FRA realized that the time period should vary depending on the employee or employees involved. The 1998 proposal also contained provisions for conducting periodic refresher training and supervisor oversight of an employee's performance once training is provided.

FRA believed that the recordkeeping and notification requirements contained in the 1998 proposal were the cornerstone of the training and qualification provisions. As FRA was not proposing specific training curricula or specific experience thresholds, FRA believed that the recordkeeping provisions were vital to ensuring that proper training was being provided to railroad personnel. FRA intended the record keeping requirements to provide the means by which FRA would judge the effectiveness and appropriateness of a railroad's training and qualification program. The proposed recordkeeping provisions also provided FRA with the ability to independently assess whether the training provided to a specific individual adequately addresses the tasks that the individual is deemed capable of performing. Finally the proposed training mandates seemed most likely to prevent railroads from using insufficiently trained individuals to perform the necessary inspections, tests, and maintenance required by the proposal.

In the 1998 NPRM, FRA proposed to require that railroads maintain specific personnel qualification records for all personnel (including their contractors' personnel) responsible for the inspection, testing, and maintenance of train brake systems. FRA proposed that the records contain detailed information regarding the training provided as well as detailed information on the types of equipment the individual is qualified to inspect, test, or maintain and the duties the individual is qualified to perform. As an additional means of ensuring that only properly qualified individuals are performing only those tasks for which they are qualified, FRA proposed that railroads be required to promptly notify personnel of changes in their qualification status and specifically identify the date that the employee's qualification ends unless refresher training is provided.

FRA recognized that some railroads would be forced to place a greater emphasis on training and qualifications than they had in the past, and as a result would incur additional costs. However, FRA believed that the proposed rule

allowed railroads the flexibility to provide only the training that an employee needs in order to perform a specific job. The 1998 proposed rule did not require an employee who performs only brake inspections while the train is en route (*i.e.,* Class II brake tests) to receive the intensive training needed for an employee who performs Class I brake tests or one who is charged with the maintenance or repair of the equipment. The training might be tailored to the specific needs of the railroad. Across the industry as a whole, the 1998 proposal would not have required extensive changes in the way most railroads currently operate, but it would have required some railroads to invest more time in the training of their personnel.

FRA recognized that the costs of the proposed training requirements were fairly substantial; however, FRA believed that most Class I railroads had already invested in training, routinely scheduled training for their employees, and offered training to other interested parties. On the other hand, FRA noted that most railroads did not engage in the ''hands-on'' training and testing contained in the proposal nor did most railroads maintain the records required in the proposal. FRA noted that many Class I railroads have participated in initiatives under the Safety Assurance and Compliance Program (SACP) with FRA and labor and that many of the proposed training requirements would already be met by those railroads that have completed the training required under the SACP.

In the 1998 NPRM, FRA recognized that the proposed training requirements would likely cause some impact to smaller railroads but believed that the impact of the requirements on these smaller operations would be somewhat reduced due to the training already provided by the railroads and due to the nature of the operations themselves. FRA noted that many smaller railroads, particularly Class II railroads, send their employees to other railroads for training, participate in ASLRA and FRA training, and have some form of on-the job training. Furthermore, Class III railroad employees are not likely to require extensive training on different types of brake equipment since most of the equipment used by Class III railroads have only one type of brake valve. Furthermore, the employees of these small railroads would likely not be required to receive any training in the areas of EPIC brakes, dynamic brakes, two-way EOT devices, or on some of the brake tests and maintenance mandated in the proposal due to the limited distances traveled by these trains, the low tonnages hauled, and because many of the maintenance functions are contracted out to larger railroads.

The AAR and its members, the ASLRA, and various private car owners submitted numerous comments regarding the proposed training requirements. Generally, these commenters believe that the significant costs being imposed by the proposed training requirements are not justified based on the industry's safety record over the last two decades. They contend that the industry's safety record is evidence that the current training provided by the railroads is sufficient. At a minimum, these commenters recommend that railroads be provided three years to implement any training requirements imposed. Such an approach would be consistent with the proposed three-year refresher training requirements and would prevent manpower shortages and ease the financial impact.

Several railroad representatives recommend that railroads not be responsible for the training of the contract personnel they employ as was proposed. They contend that railroads do not maintain records of the training or experience of these individuals and that the contractor should bear the burden of training its own employees. These commenters admit that railroads would work with contractors to help them train their employees but that the contractor should be held responsible for providing the necessary training. They assert that the contractor is in the best position to determine the training needs of its employees and that the proposed approach potentially intrudes and alters the employment relationship of contractors and railroads.

Representatives of various railroads also object to some of the administrative burdens imposed by the proposed training requirements. They contend that the requirement to identify all tasks related to the inspection, testing, and maintenance of brake systems and develop procedures for performing each task, is overly burdensome and unnecessary. They also object to the proposed requirement that the railroad's Chief Mechanical or Chief Operating Officer sign a statement for each employee attesting that the employee meets the minimum requirements. They contend that the requirement would inhibit the use of electronic records and that there is no benefit obtained by requiring such a signature. These commenters further object to the requirement that railroads implement formal internal audit programs, contending that these programs would waste scarce resources and that the effectiveness of a training program can be assessed through efficiency tests, supervisory spot checks, and other less burdensome methods.

The AAR also objects to the potential requirement that all existing employees be completely retrained. The AAR recommends that existing employees not be required to receive any new training because it is unnecessary and there has been no showing that current training is inadequate. They also suggest that there is no need for refresher training of these employees unless a new brake system is introduced. At a minimum, they recommend that the ''hands-on'' refresher training be eliminated as virtually every railroad conducts periodic efficiency testing or audits of its employees to ensure ''hands-on'' proficiency of personnel. They also contend that refresher training should only be required for those employees that repeatedly demonstrate a failure to properly perform their required duties.

Several railroad representatives also object to the proposed requirement that employees receive training and testing on each task they will be required to perform and that they be trained and tested on each type of equipment operated by the railroad. These commenters contend that these proposed requirements would be cost-prohibitive and time-consuming. They claim that it is impossible for a railroad to have every type of vehicle it operates available to train all of its employees. They recommend that the training be limited to the different brake systems operated by the railroad and that the training be required to impart the necessary skills and abilities to perform the required tasks.

The AAR and the ASLRA also object to the proposed record keeping provisions, claiming they are overly detailed and unnecessary. These commenters recommend that the record keeping burdens be reduced and that FRA should only require a list of qualified employees, the training courses completed by an employee, and the date that training was completed. They contend that each railroad is in the best position to determine the level of detail that their records should contain and that the level of detail proposed by FRA will have a significant cost burden on railroads.

Representatives of rail labor reiterate that the need for any training provisions could be greatly reduced if FRA would simply require many of the proposed inspections and tests to be conducted by qualified carmen. At a minimum, these commenters contend that any training provisions must include a requirement

for FRA approval. They assert that any training program developed by a railroad should be approved by FRA. Several labor representatives also contend that the proposed training requirements fail to adequately address supervisors charged with oversight and training instructors. They believe that specific qualifications of both supervisors and instructors should be included in any final rule developed. They further contend that the proposed requirements do not include a dispute resolution procedure which they believe is necessary to avoid potential abuses by railroads when designating qualified employees. Certain labor representatives recommend that the proposed language regarding the training on new equipment needs to be clarified to ensure that the training is provided before the new equipment is placed in service.

FRA Conclusions. FRA recognizes that there has been a significant decline in the number of brake-related derailments and other train accidents and incidents, and resulting property damage, fatalities, and injuries over the last ten years; however, FRA continues to believe these numbers can be even further reduced if the inspections and tests of brake systems are performed by individuals who have received training that specifically targets the activities which the individual is assigned responsibility to perform. FRA's experience in enforcing the existing power brake regulations supports the conclusion that the better trained a person is on how to perform a brake inspection the better that person can perform the inspection when required to do so. Many FRA field inspectors have discovered equipment with brake conditions having the potential of causing a derailment or accident that are not identified by railroad personnel because those persons responsible for finding the conditions are not sufficiently trained or equipped to conduct the inspections they are required to perform. FRA's field forces consistently find that the most comprehensive brake inspections are performed by those individuals who have received detailed training specifically related to the inspection being performed and who conduct such inspections on a consistent basis. Based on this experience, FRA believes that the training required in this final rule will enhance the quality of brake inspections, which will increase the discovery of brake conditions that have the potential of causing a derailment or other accident. Because an increased number of brake conditions having the potential of causing a derailment or other accident will be discovered prior to being used in a train, FRA expects that the training required by this rule will reduce the number of incidents caused by brake-related problems.

Furthermore, as discussed in the 1998 NPRM, railroads continue to consolidate mechanical work to fewer and fewer locations on their systems. This trend places an increasing premium on the ability of mechanical and operating forces to conduct meaningful inspections and tests of the power brake system. Increases in train speeds and increased pressure on operating personnel due to growing traffic density will continue to make it critical for operating and mechanical forces to discharge their duties with respect to the power brake system both diligently and effectively even under the most optimistic of scenarios. Technological change presents an additional reason for placing a strong emphasis on the training and qualifications of inspection personnel. Both operating and mechanical personnel are confronted with an increasing variety of power brake arrangements and features. Consequently, these trends and changes make the training required in this final rule a necessity in order to ensure and enhance the quality of brake inspections.

In addition to the safety benefits, both quantified and non-quantified, there are certain operational benefits derived from the training required by this final rule. This final rule allows an increase in the distance some trains may travel between brake inspections. These increases are premised on the condition that all of the inspection functions performed on these trains are conducted by highly trained and qualified personnel. The latitude provided to these trains will result in fewer inspections per miles traveled and will reduce the number of opportunities that exist for a serious defect to be found before it could result in a train incident. It is imperative, therefore, that each inspection performed on these trains be of uniformly high quality. FRA believes that the training required by this final rule is a key factor for ensuring such high quality inspections. FRA also believes that certain non-quantifiable operational benefits will be derived from the training required by this final rule, particularly in the areas of equipment utilization, reduced train delays, and repair costs.

FRA agrees that railroads have made significant improvements in the quality of training provided to their employees but believes that this training can be further improved. Furthermore, FRA believes that a number of railroads participating in the SACP process have already developed, or are in the process of developing, comprehensive training programs that meet many of the requirements proposed in the NPRM. Therefore, the final rule retains the basic structure and concepts that were proposed in the NPRM regarding the training of individuals responsible for conducting the inspections and tests required by the final rule. The proposed training requirements have been slightly revised in this final rule in order to clarify FRA's intent, to recognize existing training, and to reduce any unnecessary burden that may have been inadvertently created by the proposed requirements.

The final rule modifies the proposed provision that required a railroad to provide training to the personnel of a contractor to the railroad whom the railroad uses to perform the various tasks required by the rule. The final rule makes clear that the contractor is responsible for providing appropriate training to its employees. FRA agrees that railroads should not bear the burden of training the employees of a contractor. However, FRA notes that this change does not relieve the railroad from potential civil penalties for, *e.g.,* failure to perform a proper Class I brake test, if the employees of a contractor were found not to be qualified to perform the task for which they are assigned responsibility. As a contractor's employees are acting as an agent for the railroad when performing a task required by this regulation, both the railroad and the contractor would remain liable for potential civil penalties if the employees used to perform a particular task were not trained and qualified in accordance with the training requirements contained in this final rule.

The final rule retains the proposed requirement that railroads and contractors identify the tasks related to the inspection, testing, and maintenance of the brake system required to be performed by the railroad or contractor and identify the skills and knowledge necessary to perform each task. FRA believes that it is essential to developing a comprehensive training program for a railroad or contractor to go through the process of identifying the tasks they will be required to perform and determining the skills and knowledge that must be provided to perform those tasks. FRA believes that most railroads have already engaged in this activity and would merely need to revise existing data with changes made to existing requirements by this final rule. The final rule eliminates the requirement to

develop written procedures for performing each task identified. Although FRA believes that each railroad or contractor should and will develop such procedures, FRA does not believe it is necessary to require their development as FRA believes they will either be developed in the required training curricula or are sufficiently detailed in the regulation itself.

The final rule also clarifies that the required training is intended to provide employees with the skills and knowledge necessary to perform the tasks required by this final rule. FRA does not believe it is necessary to train an employee on every different type of equipment that a railroad operates or on each and every task an employee will be required to perform. FRA's intent when issuing the NPRM was to ensure that the training received by an employee provided that individual with the knowledge and skills needed to perform the tasks he or she was assigned on the various types of equipment the railroad operated. Therefore, the final rule clarifies this intent by specifically stating that the training curriculum, the examinations, and the ''hands-on'' capability should address the skills and knowledge needed to perform the various required tasks rather than focusing strictly on the tasks themselves or on the specific types of equipment operated by the railroad. The final rule also clarifies that the training that an employee is required to receive need only address the specific skills and knowledge related to the tasks that the person will be required to perform under this part. Thus, a railroad or contractor may tailor its training programs to the needs of each of its employees based on the tasks that each of its employee will be required to perform. FRA tends to agree with several commenters that there is no reason for an individual who performs strictly brake inspections and tests to be as highly trained as a carman since carmen perform many other duties related to the maintenance and repair of equipment in addition to brake inspections.

The final rule also clarifies that previous training and testing received by an employee may be considered by the railroad. FRA did not intend to require the complete retraining of every employee performing a task required in this final rule. When proposing the training requirements, FRA intended for railroads to incorporate existing training regimens and curricula into the proposed training programs. Therefore, in order to clarify this intent, the final rule contains a specific provision which permits railroads to consider previous training and testing received by an employee when determining whether an employee is qualified to perform a particular task. However, the final rule also makes clear that any previous training or testing considered by a railroad or contractor must be documented as required in the final rule. Thus, previous training or testing which has not been properly documented cannot be considered. The final rule also makes clear that employees must be trained on the specific regulatory requirements contained in this final rule related to the tasks that the employee will be required to perform. Therefore, all employees performing tasks covered by this part will require at least some training which covers the specific requirements detailed in this final rule.

The final rule retains the proposed requirement regarding the performance of periodic refresher training and testing. The final rule retains the requirement that refresher training be provided at least once every three years and that it include both classroom and experiential ''hands-on'' training and testing. FRA continues to believe that periodic refresher training is essential to ensuring the continued ability of an employee to perform a particular task. FRA does not intend for such training to be as lengthy or as formal as the initial training originally provided, but believes that the training should reemphasize key elements of various tasks and focus on items or tasks that have been identified as being problematic or of poor quality by the railroad, contractor, or its employees through the periodic assessment of the training program. The final rule also makes clear that a railroad or contractor may use efficiency testing to meet the hands-on portion of the required refresher training provided such testing is properly documented. FRA agrees that such testing provides the necessary assurances that the individual continues to have the knowledge and skills necessary to perform the task for which the employee is being tested.

The final rule also modifies the proposed requirement that railroads develop an internal audit process to evaluate the effectiveness of their training. Although FRA agrees that a formal audit process may not be necessary, FRA continues to believe that railroads and contractors should periodically assess the effectiveness of their training programs. However, rather than require a formal internal audit, FRA believes that periodic assessments may be conducted through a number of different means and each railroad or contractor may have a need to conduct the assessment in a different manner. The final rule requires that a railroad or contractor develop a plan to periodically assess its training program and, as suggested by some commenters, permits the use of efficiency tests or periodic review of employee performance as methods for conducting such review. FRA agrees that many railroads, due to their small size, are capable of assessing the quality of the training their employees receive by conducting periodic supervisory spot checks or efficiency tests of their employees' performance.

The final rule also retains the record keeping requirements proposed in the NPRM with slight modification for consistency with the changes noted above regarding the application of the skills and knowledge necessary to perform a particular task. FRA continues to believe that the record keeping and designation requirements contained in this final rule are the cornerstone of the training requirements. Contrary to the views of some commenters, FRA believes that something more than mere lists of qualified employees is needed. Because the rule allows each railroad and contractor the flexibility to develop a training program that best fits its operation and does not impose specific curriculum or experience requirements, FRA continues to believe it is vital for railroads and contractors to maintain detailed records on the training they do provide. Such documentation will allow FRA to judge the effectiveness of the training provided and will provide FRA with the ability to independently assess whether the training provided to a specific individual adequately addresses the skills and knowledge required to perform the tasks that the person is deemed qualified to perform. Moreover, requiring these records will prevent railroads and contractors from circumventing the training requirements and prevent them from attempting to utilize insufficiently trained personnel to perform the inspections and tests required by this rule.

The final rule makes clear that the required records may be maintained either electronically or in writing. Many railroads currently maintain their training records in an electronic format, and FRA sees no reason not to permit such a practice if as the information can be provided to FRA in a timely manner upon request. The proposed provision requiring the railroad's chief mechanical or chief operating officer to sign a statement regarding each employee's qualifications has been modified in the final rule to merely require identification of the person or persons

making the determination that the employee has completed the necessary training. This modification will permit the information to be maintained electronically and will still provide the accountability which FRA intended by the provision in the NPRM. FRA believes it is absolutely essential that those individuals making the determinations regarding an employee's qualification be identified in order to ensure the integrity of the training programs developed and prevent potential abuses by a railroad or contractor.

FRA also objects to the portrayal by some commenters that the records required to be maintained are overly burdensome. Virtually all of the items required to be recorded are currently maintained by most railroads in some fashion or another. Contrary to the concerns raised by some commenters, the rule does not require that the contents of each training program be maintained in each employee's file. Railroads are free to develop whatever type of cross-referencing system they desire, provided the contents of the training program are maintained in some fashion and can be readily retrieved. Furthermore, railroads currently maintain lists of individuals they deem to be qualified persons and inform those individuals as to their status to perform particular tasks. FRA believes this is a good practice and is necessary to ensure that individual employees do not attempt to perform, or are not asked to perform, tasks for which they have not been trained.

The final rule contains two provisions that were not specifically included in the NPRM but which were intended by FRA to be covered by the established training programs. The final rule requires that new brake systems be added to training programs prior to their introduction into revenue service. FRA believes this requirement is only logical and makes sense. FRA believes that prior to the introduction of any new brake system the employees responsible for inspecting and maintaining the equipment need to be specifically trained on the systems in order to adequately perform their required tasks. The final rule also requires railroads that operate trains under conditions that require their employees to set retaining valves to develop training programs which specifically address the use of retainers and provide such training to those employees responsible for using or setting retainers. This provision has been added in response to an NTSB recommendation which FRA supports. *See* NTSB Recommendation R–98–7.

FRA has not included provisions requiring FRA approval of the training programs developed by railroads or contractors as suggested by some commenters. FRA does not have the resources to implement such an approval process and does not believe such approval is necessary, given the records that will be required to be maintained. Furthermore, FRA believes that such a process would slow the implementation of training programs and, thus, slow the implementation of this final rule. An approval process would also seriously impede the ability of a railroad or contractor to make necessary and timely changes to its training program, which is necessary to ensure its currency. The final rule also does not contain a dispute-resolution provision regarding such programs. FRA believes that such matters are within the province of employee-employer relationships and are better addressed by established processes. The final rule also does not specifically address the training that must be provided to supervisors. Although some commenters recommended specific requirements, FRA believes that supervisors are sufficiently covered by the final rule requirements. FRA believes that in order for a supervisor to properly exercise oversight of an employee's work, the supervisor must be qualified to perform the tasks for which they have oversight responsibilities.

FRA realizes that many railroads will need time to bring their existing training programs up to the level required by this final rule. FRA also recognizes that the cost of the proposed training requirements is somewhat substantial and may prevent railroads from completing the necessary training in a short period of time. Moreover, FRA recognizes that railroads need time to provide the necessary training to their employees without causing manpower shortages in their operations. Therefore, the final rule allows railroads three years in which to develop and complete the required training. This period is consistent with the time requested by the AAR and other railroad commenters. It is also consistent with the requirement to provide refresher training at least every three years and will allow a railroad to have one-third of its inspection forces receive the necessary refresher training each year after the initial training is complete.

F. Air Source Requirements

In the 1998 NPRM, FRA again proposed a ban on the use of anti-freeze chemicals in train air brake systems, reiterating the position stated in the 1994 NPRM, in order to prevent untimely damage and wear to brake system components. *See* 59 FR 47728. At that time, FRA had not received any adverse comments on this issue in response to the 1994 NPRM, in which a similar requirement was proposed. Furthermore, statements and discussions provided at various RSAC Working Group meetings appeared to establish that both rail labor and rail management representatives believed that such a provision would be acceptable.

Based on information gathered throughout the RSAC process, previous comments by industry parties, and agency experience, FRA firmly believes that the presence of moisture in the train air brake system poses potential safety, operational, and maintenance issues that require attention in this rulemaking. After completion of detailed, instrumented testing on both locomotives and yard test plants performed as part of the task force activities, FRA determined that locomotives rarely contribute to moisture in the trainline. Consequently, FRA did not propose that air dryers be installed on new locomotives, as was proposed in the 1994 NPRM (59 FR 47729). A detailed discussion of the testing conducted by the RSAC Working Group members and recommendations regarding air dryers appears in the preamble of the 1998 NPRM. *See* 63 FR 48317–19.

In contrast, the results of the same testing clearly indicated to FRA that yard air plants often provide unacceptably high levels of moisture while charging the train air brake system due to the age of the system, improper design, inadequate maintenance, or a combination thereof. Working Group task force efforts also estimated that upwards of 80 percent of train air brake systems are charged using yard/ground air plants. However, FRA did not believe that simply requiring yard air sources to be equipped with air dryers would solve or address the problem. In order for air dryers to be effective on yard air sources, the air dryers must be properly placed to sufficiently condition the air source. FRA determined that many yard air sources are configured such that a single air compressor services several branch lines used to charge train air brake systems; therefore, multiple air dryers would be required to eliminate the introduction of moisture into the brake system. Consequently, FRA determined that requiring yard air sources to be equipped with air dryers would impose a significant and unnecessary cost burden on the railroads.

Based on its determination that air dryers would not provide a cost effective or suitable solution, FRA considered other viable alternatives. In the 1998 NPRM, FRA proposed that each railroad develop and implement a system by which it would monitor all yard air sources to ensure that the air sources operate as intended and do not introduce contaminates into the brake system. FRA believed that the proposed monitoring program provided a method by which the industry might maximize the benefits to be realized through air dryer technology, which all parties acknowledge has been proven to reduce the level of moisture introduced into the trainline, at a cost that was commensurate with the potential benefits. The proposed monitoring program required railroads to take remedial action with respect to any yard air sources that were found not operating as intended, and established a retention requirement for records of the deficient units to facilitate the tracking and resolution of continuing problem areas. FRA also proposed that yard air reservoirs either be equipped with an operative automatic drain system or be manually drained at least once each day that the devices were used or when moisture was detected in the system. FRA believed that these proposed provisions, in concert with assurances that condensation is blown from the pipe or hose from which compressed air is taken prior to connecting the yard air line or motive power to the train, as currently prescribed in § 232.11(d), would significantly minimize the possibility of moisture being introduced into the train air brake system.

In the 1998 NPRM, FRA noted the recent issuance of a final rule mandating the incorporation of two-way end-of-train telemetry devices (two-way EOTs) on a variety of freight trains, specifically those operating at speeds of 30 mph or greater or in heavy grade territories. *See* 62 FR 278. Two-way EOTs provide locomotive engineers with the capability of initiating an emergency brake application that commences at the rear of the train in the event of a blockage or separation in the train's brake pipe that would prevent the pneumatic transmission of the emergency brake application throughout the entire train. FRA noted that the issuance of a final rule mandating the use of these devices was significant particularly in the context of air source requirements and air dryers. In the unlikely event that the proposed requirements regarding air sources fail to sufficiently eliminate moisture from the trainline, and a restriction or obstruction in the form of ice forms as the result of the freezing of this moisture during cold weather operations, the two-way EOT device becomes a first order safety device and will initiate an emergency application of the brakes from the rear of train. Therefore, many of the concerns associated with moisture in the trainline freezing in cold weather operations have been alleviated through the incorporation of this technology in most freight operations, thus reducing the need or desire to specifically require air dryers on air sources.

The AAR and its member railroads submitted various comments related to the proposed air source requirements. Although various railroads had previously indicated support for a requirement banning the use of alcohol in train brake system and stated that their railroad no longer used alcohol in its operation, they now object to the proposed requirement prohibiting the use of the such chemicals. These commenters now assert that there are instances in the industry where alcohol is used to unfreeze frozen trainlines. They contend that railroads should be permitted to continue this practice in order to move trains in certain circumstances and that the need to use alcohol would be rare but necessary. The AAR contends that the use of the term ''chemical'' is inappropriate, and, unless there is an alternative, the requirement should be deleted. They contend that frozen trainlines are a reality and railroads must be provided some method to deal with such occurrences other than waiting for warm weather which could take months.

These commenters also discussed the proposed requirements related the development and implementation of monitoring plans for yard air sources. The AAR contends that the railroads would need at least five years to comply with the proposed requirements and would incur costs of $41 million. These commenters object to the requirement for remedial action when a yard air source is found to have the ''potential'' of introducing contaminants into the equipment it services. They contend that such remedial action should be required only if the yard air source actually introduces such contaminants. These commenters also object to the requirement for a detailed assessment of the remedial actions taken as unnecessary and believe that the recordkeeping requirements merely increase a railroad's administrative burden and are merely included as enforcement traps.

Several representatives of rail labor and the NTSB support the proposed prohibition on the use of alcohol and object to any allowance of its use. Some labor representatives suggested that, if FRA were to allow the use of alcohol, then it needed to reinstate the requirements to perform periodic clean, oil, test, and stencilling (COT&S). These commenters recommend that the prohibition be extended to any device providing air to a train's brake system. The BRC again asserts that FRA should require that locomotives and air sources be equipped with air dryers, contending that they are the only way to ensure that moisture is not introduced into a train's brake system. Labor representatives also object to the proposed yard air monitoring plan requirements, contending that the proposed requirements fail to specify the frequency with which yard air sources are to be inspected. They recommend that such inspections should be more frequent at locations in cold climates. They also suggest that the monitoring plans should be subject to FRA approval prior to implementation.

FRA Conclusions. The final rule retains the basic requirements regarding yard air sources and cold weather operations that were proposed in the 1998 NPRM. The final rule generally retains the proposed requirement prohibiting the use of chemicals in a train air brake system. However, FRA agrees that the proposed prohibition of all chemicals may have been somewhat overbroad and contrary to FRA's actual intent. In proposing the prohibition, FRA intended to eliminate the use of chemicals, such as alcohol, which are known to degrade the rubber of a train's brake system. FRA agrees that there are chemicals that are currently available or that are in the process of being developed that do not cause the problems associated with the use of alcohol. In fact, FRA believes there are products currently available that do not degrade a brake system's rubber components like alcohol does. FRA believes that several railroads are currently testing or using these chemical alternatives. Consequently, the final rule slightly modifies the prohibition on the use of chemicals by imposing the prohibition on chemicals that are known to degrade or harm brake system components, such as alcohol.

The final rule also modifies some of the requirements related to the proposed yard air source monitoring plans. FRA agrees that the proposed requirements did not establish a frequency with which inspections of yard air sources should be conducted. In proposing the requirement, FRA hoped that various commenters would recommend frequencies for conducting these

inspections. This did not occur. FRA agrees that a set frequency needs to be established that will ensure that yard air sources are inspected in a timely manner during various climatic conditions. Therefore, the final rule requires the that yard air sources be inspected at least twice each calendar year and that two of the inspections be no less than five months apart. FRA intends for this requirement to result in yard air sources being inspected each year during two different seasonal periods.

The final rule also clarifies that remedial action under the monitoring plans is required only on those yard air sources that are not operating as intended or that are found introducing contaminants into brake systems. Thus, the final rule removes the word ''potential'' as FRA agrees that the proposed language was unclear and may have been over-inclusive. The final rule also eliminates the requirement for railroads to conduct a detailed assessment of the remedial actions taken. FRA agrees that this requirement is unnecessary because railroads will be conducting regular inspections of the yard air sources on which they have conducted repairs or taken other remedial action and will be able to determine if the repairs were effective through those inspections. The final rule retains the other proposed record keeping requirements related to yard air monitoring plans but clarifies that the records may be maintained either electronically or in writing. FRA continues to believe that these records are necessary to ensure that railroads are properly conducting the required inspections and are taking timely and appropriate remedial action when a problem air source is detected.

The final rule does not contain provisions requiring FRA approval of the yard air source monitoring plans prior to their implementation as suggested by some commenters. FRA does not have the manpower or resources to review and approve the plan of each railroad and does not believe such approval is necessary given the specific requirements contained in the final rule and the records that are required to be maintained. The final rule also does not contain requirements regarding the use of air dryers on either locomotives or yard air sources. For the reasons noted in the discussion above and in the NPRM, FRA believes that requiring the use of air dryers on either locomotives or yard air sources would impose a significant cost burden on railroads and would not necessarily address the problem sought to be resolved. *See* 63 FR 48317–19. It should be noted that FRA advocates the use of air dryers when possible and agrees that they have proven effective in reducing the level of moisture introduced into the brake system; however, FRA believes that the railroad is in the best position to determine where these devices will provide the greatest benefit based on the railroad's operation.

FRA is somewhat skeptical of the AAR's contentions regarding both the time and the cost necessary to implement the required yard air source monitoring plans. FRA sees no reason why a railroad would need five years to implement a plan to inspect each of its yard air sources twice a year. These devices are used on a fairly regular, if not daily, basis and should not be that difficult to inspect. Therefore, FRA believes that railroads should easily be able to implement these monitoring plans within the three years allowed under the applicable date provided in this final rule.

G. Maintenance Requirements

Based on comments received in response to the 1994 NPRM, deliberations of the RSAC Working Group and task force, and field experience, FRA proposed a comprehensive set of maintenance requirements which were intended to be a codification of current best practices occurring within the industry. The preamble to the 1998 NPRM contains a detailed discussion of the issues raised, discussed, and considered prior to the issuance of the NPRM. *See* 63 FR 48320–22.

After consideration of all the information and comments submitted prior to the issuance of the 1998 NPRM, FRA remained confident that the ''new'' repair track test and single car test, which have been used industry-wide since January of 1992, are a much better and more comprehensive method of detecting and eliminating defective brake equipment and components than the old, time-based COT&S requirements. FRA continued to believe that performance of the repair track and single car test significantly reduces the number of defective components and dramatically increases the reliability of brake equipment. Accordingly, FRA proposed the incorporation of AAR Interchange Rule 3 and Chart A into the 1998 NPRM, thus codifying the repair track air test requirements per Chart A, such that a railroad would be required to perform a repair track brake test on freight cars in any of the following six circumstances: (i) When a freight car is removed from a train due to an air brake related defect; (ii) when a freight car has its brakes cut out when removed from a train or when placed on a shop or repair track; (iii) when a freight car is on a repair or shop track for any reason and has not received a repair track brake test within the previous 12 month period; (iv) when a freight car is found with missing or incomplete repair track brake test information; (v) when the brake reservoir(s), the control valve mounting gasket, and the pipe bracket stud are removed, repaired, or replaced; or (vi) when a freight car is found with a wheel with a built-up tread, a slid flat, or a thermal crack. FRA also proposed that each freight car receive a repair track air test no less frequently than every 5 years, and not less than 8 years from the date the car was built or rebuilt. Similarly, it was proposed that the single car test requirements of Chart A be codified, such that a railroad would perform a single car test on a freight car when the service portion, the emergency portion, or the pipe bracket or a combination of such components is removed, repaired, or replaced.

In the 1998 NPRM, FRA recognized that circumstances arise where the proposed repair track brake tests or single car tests could not always be performed at the point where repairs can be made that necessitate performance of the test. To address these circumstances, FRA proposed that a car would be allowed to be moved to the next forward location where the test could be performed after the necessary repairs were conducted. FRA attempted to make clear that the inability to perform a repair track brake test or a single car test did not constitute an inability to effectuate the necessary repairs. At the same time, however, FRA recognized rail labor's contention that some carriers often attempt to circumvent the requirements for single car and repair track testing through the elimination of repair tracks, by moving cars to ''expediter'' tracks for repair, or simply by making the repairs in the field. As a means to curtail these practices, FRA decided to impose extensive tagging requirements on freight cars that, due to the nature of the defective condition(s) detected, require a repair track brake test or single car test but that are moved from the location where repairs are performed prior to receiving the required test. As an alternative to the tagging requirements, FRA proposed that railroads be permitted to utilize an automated tracking system to monitor these cars and ensure they receive the requisite tests provided the automated system has been approved by FRA. FRA also proposed to require stencilling of cars with the location and date of the last

repair track or single car test. Alternatively, FRA proposed that railroads could utilize an electronic record keeping system to accomplish this stencilling requirement, provided the system has been approved by FRA. FRA believed that the proposed tagging and stencilling requirements were necessary to ensure the timely performance of the tests. Without such information, there would be virtually no way for FRA to verify a railroad's compliance with the proposed repair track and single car test requirements.

FRA also proposed various requirements related to the testing of the devices used to perform the single car tests. Similar to the 1994 NPRM, the 1998 NPRM again proposed that single car testing devices be tested at least once a day and receive routine maintenance at least every 92 days. FRA also proposed that the mechanical and electronic test devices be regularly calibrated.

In the 1998 NPRM, FRA determined that any changes to the AAR standards incorporated into regulation should be reviewed and approved by all affected parties, including FRA and rail labor. Consequently, FRA proposed a special approval process, whereby the AAR would be required to submit any proposed changes to the FRA. FRA would review the proposed change to determine whether the change is ''safety-critical.'' Such proposed changes include, but are not limited to the following: (i) Any changes to Chart A, (ii) changes to established maintenance intervals, and (iii) changes to UMLER reporting requirements. If the proposed change was deemed by FRA to be ''non safety-critical,'' FRA would permit the change to be implemented immediately. If the proposed change was deemed ''safety-critical,'' FRA would be required to publish a **Federal Register** notice, conduct a public hearing if necessary, and act based on the information developed and submitted in regard to these proceedings.

FRA proposed the special approval process in response to comments from several railroads and manufacturers that FRA needed to devise some sort of quick approval process in order to permit the industry to make modifications to existing standards or equipment based on the development of new technology. Thus, FRA attempted to propose an approval process it believed would speed the process for taking advantage of new technologies over that which is currently available under the waiver process. However, in order to provide an opportunity for all interested parties to provide input for use by FRA in its decision-making process as required by the Administrative Procedure Act, FRA determined that any special approval provision must, at a minimum, provide proper notice to the public of any significant change or action being considered by the agency with regard to existing regulations.

The AAR, its members, and various private car owners and brake manufacturers submitted numerous comments regarding the maintenance requirements proposed in the NPRM. The commenters object to the proposed incorporation of AAR's Rule 3, Chart A, and the incorporation of specific AAR standards for performing single car and repair track air brake tests. They contend that such incorporation would inhibit the ability of the industry to develop and implement new rules and procedures that would improve safety and hinder the ability of the industry to implement changes that improve brake performance. They contend that the current reference to AAR rules is sufficient and that oversight by FRA is not necessary. The AAR notes that there have been over 25 changes to the AAR maintenance requirements and test procedures over the last ten years and that many of these may not have been accomplished under the provisions proposed in the NPRM. The AAR also notes that the single car and repair track standards cited in the NPRM were changed in July of 1998 and were being revised again in 1999. These commenters recommend that any provisions requiring FRA approval of AAR standards should be eliminated. Alternatively, they recommend that AAR be permitted to implement changes subject to FRA revocation based on a finding that the change does not promote safety.

In addition to their general objections to any incorporation of AAR maintenance standards, these commenters provide several recommendations in the event that FRA should decide to retain the proposed requirements. They recommend that FRA eliminate the requirement to stencil equipment with the date of the last single car or repair track air brake test and allow the industry to use the UMLER tracking system to record and monitor such information. They believe that the industry should be permitted to implement an automated or electronic tracking system without prior FRA approval. They contend that the industry has been using the UMLER system to track this information for years and it has proven effective. They contend that the automated system currently used is no less secure or capable of manipulation than a manual stenciling requirement. They contend that there has been no evidence of falsification on the part of railroads using the UMLER system and that it should be permitted without FRA approval.

Several railroad representatives also object to the proposed requirement for performing a repair track air brake test whenever a car is removed from a train for a brake-related defect. They contend that the way the provision is proposed it would require repair track air brake tests whenever minor brake defects occur that have no relation to the actual operation of the brakes. They recommend that the requirement be tied to cars removed from trains for inoperative brakes as this is the intent of AAR's Rule 3, Chart A. These commenters also object to the proposed requirement to perform a set and release of the brakes and to check piston travel when a car is on a shop or repair track. They contend that AAR no longer requires this to be performed and assert that the brake tests required in the proposal are sufficient to determine piston travel and proper operation of the brakes. These commenters also contend that there is no need to retain the bad order tags required for moving equipment for testing because a record of the repair is maintained for a year pursuant to AAR rules. They also recommend that FRA should not require brake repairs at locations where single car or repair track tests cannot be performed. They contend that the test is necessary to determine the sufficiency of the repair. They believe that the inability to conduct these test should be considered an inability to conduct brake repairs.

The AAR and certain manufacturers of brake equipment also raise concerns over the proposed requirements related to the testing and calibration of devices used to perform single car and repair track air tests. These commenters generally object to the inclusion of these requirements in the proposal as they have always been part of AAR standard S–486 and feel they do not belong in federal regulations. These parties also contend that the proposed requirements regarding the testing and calibration of single car test devices are more restrictive than are currently required. The current existing industry requirements for testing single car test devices are based on the date on which the device is placed in service. Thus, the time for conducting the 92-day test does not begin to run until the device is placed in service. They contend that the ''in service'' date allows railroads flexibility in having spare devices when

a primary device is being serviced as such a device is generally sent to a special location for calibration and cleaning. At a minimum, they recommend that the rule permit testing and calibration of single car test devices based on the in-service date of the device rather than a strict 92-day requirement.

Representatives of rail labor support the incorporation of AAR standards and contend that AAR should not be allowed unilateral discretion to change the incorporated standards. These commenters assert that railroads do not currently follow existing AAR standards and will not do so unless they are made part of a federal regulation. These commenters recommend that FRA develop specific, detailed maintenance requirements rather than reference AAR standards. They further contend that all maintenance should be required to be performed by a carman or at least by a QMI as defined in the NPRM. These commenters object to any type of automated tracking system as it is susceptible to abuse and manipulation by railroads.

Certain labor representatives provided specific comments on the proposed requirements related to conducting single car and repair track air brake tests. They recommend that FRA identify locations where single car and repair track air brake tests can be performed to prevent manipulation and circumvention of the requirements by railroads. These commenters contend that only a carman or a QMI should be permitted to perform a single car or repair track air brake test. They also contend that, since periodic COT&S has been eliminated, the need to conduct frequent repair track and single car tests is much greater in order to ensure the proper operation of the brake equipment. They assert that the intervals for conducting these tests need to be increased over those proposed and recommend that each car receive a repair track air brake every year and a single car test every four years.

FRA Conclusions. Although the final rule retains many of the proposed maintenance requirements, several modifications have been made in this final rule in response to comments received and based upon the current best practices occurring within the industry. FRA agrees that the proposed incorporation of AAR Rule 3, Chart A, is unnecessary as it would remove the determination of when certain maintenance is performed from the discretion of the railroads, and would make it difficult for railroads to change the requirements related to the performance of that maintenance. FRA believes that a railroad is in the best position to determine when and where it will perform various maintenance on its equipment and should not have its hands tied in this area by overly prescriptive federal requirements. Furthermore, FRA's primary intent when proposing incorporation of AAR Rule 3, Chart A, was to codify the existing requirements for performing single car and repair track air brake tests and eliminate the right of the industry to unilaterally change the frequency and method of performing these tests. As the final rule retains the requirements for when and how these tests are to be completed and retains certain inspections that are to be performed when equipment is on a shop or repair track, FRA believes that it is unnecessary to incorporate every maintenance procedure covered in AAR's Rule 3, Chart A. Consequently, the final rule does not incorporate AAR's Rule 3, Chart A, and continues to allow railroads some flexibility in determining appropriate maintenance practices.

Contrary to the assertions of some commenters, FRA continues to believe that certain maintenance procedures are critical to ensuring the safe and proper operation of the brake equipment on the nation's fleet of freight cars. FRA does not believe that the determination of what maintenance should be performed should be left solely to the discretion of the railroads operating the equipment in all circumstances. As periodic COT&S maintenance has been eliminated and replaced with the performance of single car and repair track tests, which FRA agrees is a better and more comprehensive method of detecting defective brake equipment and components, FRA believes that specific and determinable limits must be placed on the manner and frequency in which these tests are performed. Therefore, the final rule retains the proposed requirements regarding the performance of single car and repair track tests.

FRA recognizes that the procedures for performing single car and repair track tests proposed in the NPRM have been modified by the AAR since the issuance of the proposal. As it is FRA's intent to incorporate the most recent version of the single car and repair track air brake test procedures, the final rule incorporates the test procedures that were issued by the AAR in April of 1999. FRA recognizes that the industry may find it necessary to modify the test procedures from time to time in order to address new equipment or utilize new technology. Thus, the final rule permits railroads to seek approval of alternative procedures through the special approval process contained in the final rule. The special approval process is intended to speed FRA's consideration of a party's request to utilize an alternative procedure from the one identified in the rule itself. FRA believes that it is essential for FRA to approve any change made in the procedures for conducting these safety-critical tests in order to prevent unilateral changes and to ensure consistency in the method in which the tests are performed.

It should be noted that the incorporated procedures for performing single car and repair track air brake tests are the minimum requirements for performing such tests. The special approval process is required to be used only if the incorporated procedures are to be changed in some manner. For instance, if the industry were to elect to add a new test protocol to the incorporated procedures, there would be no need to seek approval of such an addition as long as the procedures contained in the incorporated standard are still maintained. This final rule is not intended to prevent railroads from voluntarily adopting additional or more stringent maintenance standards provided they are consistent with the standards incorporated.

The final rule also modifies one of the proposed conditions for when a repair track air brake test would be required to be performed. FRA agrees that the proposed requirement to perform a repair track air brake test on any car removed from a train for a brake-related defect is overly restrictive and inconsistent with the requirements of AAR's Rule 3, Chart A. FRA agrees that the proposed requirement would require the performance of the test when minor brake system repairs are conducted, which is not the intent of the AAR's rule. Therefore, the final rule modifies the proposed condition to require the performance of a repair track test on cars that have inoperative or cut-out air brakes when removed from a train.

The final rule also modifies the proposed requirements regarding the use of an automated tracking system in lieu of stenciling equipment with the date and location of the last single car or repair track test received. Since 1992, the industry has utilized the AAR's UMLER reporting system to electronically track the performance of single car and repair track air brake test as well as other repair information. Based on the performance and use of this system over the last seven years, FRA believes that the AAR's UMLER system has proven itself effective for tracking the information required in this final rule and ensuring the timely performance of single car and repair

track air brake tests. Furthermore, FRA continues to believe that the information required to be tracked with regard to these tests is easily maintained through an electronic medium. Moreover, FRA has found no substantiated instances of railroads falsifying or altering the information monitored and tracked by AAR's UMLER system. Thus, the final rule permits railroad to utilize an electronic record keeping system to track single car and repair track air brake tests without obtaining prior FRA approval of the system. The final rule makes clear that FRA will monitor the performance of such systems and retains the right to revoke a railroad's authority to utilize the system if FRA finds that it is not properly secure, inaccessible to FRA or a railroad's employees, or fails to properly or adequately track and monitor the equipment.

The final rule does not increase the proposed frequency at which the single car or repair track air brake tests are to be performed as recommended by some commenters. As noted above, the primary intent of the proposed provisions was to codify the existing requirements regarding the performance of single car and repair track air brake tests and prevent any unilateral changes to those requirements. FRA believes that the frequency at which these tests are currently required to be performed under industry standards has proven to be sufficient and a substantial economic burden would be imposed if the frequency were increased. The final rule also retains the requirement that these tests be conducted by a qualified person. FRA believes that the person performing these tests must be specifically trained and tested on how the test is to be performed and be able to determine the appropriate actions that must be taken based on the results of the test. FRA does not believe that the mere fact that a person is a carman or a QMI is sufficient to consider that person qualified to perform single car or repair track air brake tests. FRA believes that the training requirements contained in this final rule ensure that a person deemed qualified to perform these tests has been specifically trained and tested on the performance of the tests prior to being considered qualified.

The final rule also retains the proposed provisions permitting cars to be moved from a location where necessary repairs are made to a location where a single car or repair track air brake test can be performed if it cannot be performed at the same location where the repairs are conducted. FRA disagrees with the assertion that air brake repairs should not be required at locations that lack the ability to perform single car or repair track air brake tests. FRA believes that position is not only contrary to the statutory mandates regarding the movement of equipment with defective brakes but would open the door to potential abuse by railroads. Furthermore, the operation of a car's brake system can generally be tested after a repair without performing a complete repair track air brake test. For the most part, single car and repair track air brake tests are intended to be maintenance requirements that attach based on a condition in which a car is found or on a repair that is required to be performed. If the condition of a car is such that a repair track air brake test is necessary to determine the defect, then the final rule would permit movement of the car to the nearest location where a repair track air brake test can be performed. However, FRA believes that most defective conditions can be easily determined without performing a repair track air brake test. Moreover, for years FRA has required the performance of repairs where they can be performed and has allowed such equipment to be moved to the next forward location for performance of a single car or repair track air brake test and has not found that such a practice has created any potential safety hazard.

The final rule retains the proposed requirements for tagging equipment which is being hauled for the performance of a single car or repair track air brake test after the appropriate repairs have been conducted. FRA believes that the tags are necessary not only to provide notice to a railroad's ground forces as to the presence of the car but to ensure that railroads are properly performing the tests at appropriate locations. Furthermore, many railroads currently move equipment in this fashion, and there has been no indication that safety has been compromised. The final rule also retains the requirement that a copy or record of the tag be retained for 90 days and made available to FRA upon request. Contrary to the objections of some commenters, FRA continues to believe that the record keeping requirements are necessary so that there is accountability on the part of the railroads to conduct these tests at the proper locations and that equipment is not moved for extended periods without receiving its required maintenance. It should be noted that the final rule clarifies that the record or copy of the tag may be maintained either electronically or in writing provided all the required information is recorded. The final rule does not define or require identification of locations that can or will perform single car or repair track air brake tests as suggested by some commenters. FRA does not believe that such a requirement is necessary as the rule specifically establishes when the tests are to be performed and it is in the railroad's best interests to perform the tests in a timely manner.

The final rule retains the proposed provisions requiring certain tests and inspections to be performed whenever a car is on a shop or repair track. Although the AAR asserts that it did away with the requirements to perform a set and release of the brakes and adjust piston travel on all cars on repair or shop tracks, the requirements are currently contained in power brake regulations separate and apart from any AAR requirements. *See* 49 CFR 232.17(a)(2)(ii), (iv). FRA believes that repair and shop tracks provide an ideal setting for railroads to conduct an individualized inspection on a car's brake system to ensure its proper operation and that such an inspection is necessary to reduce the potential of cars with excessive piston travel being overlooked when employees are performing the ordinary brake inspections required by this final rule. If any problems are detected at that location, the personnel needed to make any necessary corrections are already present. Furthermore, performing these inspections at this time ensures proper operation of the cars' brakes and eliminates the potential of having to cut cars out of an assembled train and, thus, should reduce inspection times and make for more efficient operations.

The final rule adds two items to the inspections that are to be conducted when a car is on a shop or repair track. They are an inspection of a car's hand brake and an inspection of the accuracy and operation of any brake indicators on cars so equipped. The final rule does not provide for the specific inspection of these items during any of the other required brake tests. Consequently, FRA believes this is an ideal time for the railroad to inspect these items while imposing the least burden on the railroad's inspection and repair forces.

As the final rule requires that certain inspections and tests be performed when a car is on a shop or repair track and because a repair track air brake test is required to be performed when a car is on a repair track and such a test has not been performed within the last twelve months, FRA believes it is necessary to clarify what constitutes a shop or repair track. This issue has become more prevalent over the last few years due to the growing use of mobile repair trucks and due to the requirements for conducting repair track

air brake tests. For years, many railroads have conducted minor repairs on tracks called ''expedite tracks.'' Generally, the types of repairs that were performed on these tracks were minor repairs that could be made quickly with a limited amount of equipment, and neither the railroads or FRA considered the tracks to be repair tracks. However, recently railroads have started performing virtually every type of repair on these expedite tracks. These tracks are no longer limited to minor repairs but are being used to perform heavy, complex repairs that require the jacking of entire cars or the disassembly and replacement of major portions of a car's truck or brake system. At many locations these expedite tracks are positioned next to operative repair shops. Furthermore, several railroads have closed previously existing repair shop facilities and are now using fully equipped mobile repair trucks to perform the same type of repairs that were previously performed in the shop or on established repair tracks and are attempting to call the tracks serviced by these mobile repair trucks ''expedite tracks.'' Thus, the line between what constitutes a repair or shop track and what constitutes an ''expedite track'' has become unclear, if not, nonexistent.

FRA believes that the operational changes, noted above, are partly an attempt by the railroads to circumvent the requirements that currently apply when a car is on a shop or repair track. Currently, if a car is on a shop or repair track, it must have its brakes inspected, under 49 CFR 232.17(a)(2)(ii), (iv), and the car is to receive a repair track air brake test if it has not received one in the last twelve months under AAR Rule 3, Chart A. Some railroads contend that an expedite track is not a repair or shop track; therefore, the requirements of § 232.17(a)(2)(ii), (iv) do not apply. FRA finds this interpretation to be unacceptable and believes that railroads are abusing the concept of expedite tracks to avoid performing required maintenance. Therefore, the industry's own actions have caused the need for FRA to clarify what constitutes a shop or repair track. Consequently, the final rule includes a definition of what FRA will consider to be repair or shop tracks requiring the performance of certain tests and inspections.

The final rule makes clear that FRA will consider certain tracks to be repair or shop tracks based on the types of repairs that are made on the tracks, not necessarily the designation given by a railroad. The definition in the final rule also makes clear that it is the nature of the repairs being conducted on a certain track that is the determining factor not whether a mobile repair truck is being used to make the repairs. Due to the ability of mobile repair trucks to make virtually any type of repair necessary and due to their growing use, FRA does not believe that tracks regularly and continually serviced by these types of vehicles should be excepted from the definition of a repair track. FRA believes that if a track is designated by the railroad as an ''expedite'' track (*i.e.,* one where minor repairs will be conducted) then the railroad should ensure that only cars needing minor repairs be directed to that track for repair. The final rule does not eliminate the concept of expedite tracks but limits the use of such tracks to those types of repairs that are truly minor in nature and that require a limited amount of equipment to perform. At locations where a railroad conducts repairs of all types, either with fixed facilities or with mobile repair trucks, FRA would expect the railroad to designate certain trackage at the location as repair tracks and certain trackage as ''expedite tracks'' where only minor repairs would be conducted. In such circumstances, FRA would expect railroads to direct cars in need of heavier repairs, the kind that have been traditionally performed on a shop or repair track, to be directed to trackage designated at the location as a repair track.

The final rule places the burden on the railroad to designate those tracks it will consider repair tracks at locations where it performs both minor and heavy repairs, and makes the railroad responsible for directing the equipment in need of repair to the appropriate trackage. If the railroad determines that repairs of a heavy nature will be performed on certain trackage, then the track should be treated as a repair track, and any car repaired on that trackage should be provided the attention required by this final rule for cars on a shop or repair track. Further, if a railroad determines that minor repairs will be performed on certain trackage, then the railroad bears the burden of ensuring that only cars needing minor repairs are directed to that trackage. If the railroad fails to adequately distinguish the tracks performing minor repairs from those tracks performing heavy repairs or improperly performs heavy repairs on a track designated as an ''expedite track,'' then the railroad will be required to treat all cars on the trackage at the time that the heavy repairs are being conducted as though they are on a repair or shop track.

It should be noted that the issue of what constitutes a repair or shop track for the purposes of 49 CFR 232.17(a)(2)(ii) and (iv) is completely separate and distinct from the issue of whether a location is a location where necessary repairs can be performed for purposes of 49 U.S.C. 20303. Although an outlying location might be considered a location where certain brake repairs can be conducted, that does not mean the track where those repairs are performed should be considered a repair track. FRA does not intend for trackage located at outlying locations or sidings which are occasionally or even regularly serviced by mobile repair trucks to be considered repair tracks. FRA believes that repair or shop tracks should exist at locations that have fixed repair facilities and at locations where repairs of all types are performed on a regular and consistent basis regardless of whether the repairs are performed in fixed facilities or by mobile repair vehicles.

The final rule also modifies some of the proposed provisions regarding the testing and calibration of single car test devices and other mechanical devices used to perform single car and repair track air brake tests. FRA's intent when proposing the requirements was to codify the current best practices of the industry. Thus, FRA did not intend to propose testing and calibration requirements that were more stringent that those currently imposed by AAR standards. Therefore, FRA agrees that the testing and calibration requirements for single car test devices should not be imposed until the devices are actually placed in service, which is consistent with current AAR requirements. FRA recognizes that the proposed calibration and testing requirements may have resulted the unnecessary acquisition of single car testing devices. Consequently, the final rule makes clear that the 92-day and the 365-day requirements related to single car test devices are to be calculated from the day on which the device is first placed in service.

III. Section-by-Section Analysis

Amendments to 49 CFR Part 229

The amendments to part 229 contained in this final rule concern the testing of electronic gauges commonly used in electronically controlled locomotive brake systems. Currently, there are two electronically controlled locomotive brake systems in use on the nation's railroads, the Electro-Pneumatic Integrated Control (EPIC) system supplied by Westinghouse Air Brake Company and the Computer Controlled Brake (CCB) system developed by New York Air Brake Company. At this time, there are thousands of locomotives in service that

are equipped with either the CCB system or the EPIC system.

The final rule retains the proposed requirements extending the testing cycles for the electronic gauges used in these types of locomotive brake systems. The final rule retains the proposed increase of the testing interval for these electronic gauges from 92 days to one year. Although certain labor representatives objected to the proposed increase in the testing interval, contending that the interval should be reduced due to problems encountered by numerous locomotive engineers, FRA continues to believe that technology incorporated into the electronic gauges used in these locomotive brake systems has significantly increased their reliability over standard mechanical gauges. Furthermore, the objections raised were not based on the proper operation or performance of the electronic gauges.

The lengthening of the testing interval for these gauges is based on recommendations made by a committee formed to address issues related to the operation of electronically controlled locomotive brake systems as well as the training of those individuals using this new technology. In May of 1996, the RSAC Working Group decided to form a task force to consider issues related to electronically controlled locomotive brake systems. Rather than create an entirely new task force, the Working Group assigned the task to a group of individuals who were members of the previously established ''New Technology Joint Information Committee.'' This task force, comprised of representatives from the railroad industry, rail labor, air brake manufacturers, and locomotive manufacturers, addressed several issues related to these braking systems including: design; training; inspection and testing; and maintenance. The task force concluded that additional regulation of these types of locomotive braking systems was unnecessary since the current regulations or waivers sufficiently address the training, inspection, and maintenance of these systems and any additional design requirement would most likely not enhance safety and would probably restrict the advancement of new technology. The task force recommended that part 229 be revised to increase the testing interval for these electronic gauges from 92 days to an annual cycle. The task force based this recommendation on its finding that the electronic gauges used in these brake system are much more reliable than standard mechanical gauges due to the following: the electronic components have longer life cycles than those in mechanical gauges; the accuracy and durability of the transducer have been extended; and internal computer diagnostics detect inaccuracies before gauges becoming defective under federal regulations. FRA continues to agree with these findings and has retained the proposed extension in this final rule.

The final rule does not include the proposed requirement that locomotive compressors be tested for capacity by orifice test during the annual test required by § 229.27. FRA agrees that the requirement for orifice testing of locomotive air compressors was eliminated from part 229 in 1980. See 45 FR 21097. At that time, FRA found that such a test was not useful in detecting a bad compressor and, thus, found no reason to retain the requirement. Although the requirement to perform orifice testing remained in § 232.10(c), FRA's elimination of the requirement from part 229 rendered the provision in part 232 meaningless. As no railroad has performed orifice testing since 1980 and because FRA is not aware of any safety hazard being created due to the elimination of such testing, FRA agrees that there is no justification for reinstating the requirement to perform such testing.

Amendments to 49 CFR Part 231

The final rule retains the proposed clarifying changes in the applicability section of this part. FRA received no comments objecting to the proposed modifications. The changes are intended to make the regulatory exceptions consistent with the exceptions contained in the statute. The added exceptions are taken directly from 49 U.S.C. 20301 (previously codified at 45 U.S.C. 6). It is noted that the words ''freight and other non-passenger'' have been added to the exceptions in order to remain consistent with Congress' intent when the statutory exceptions were created. At the time that Congress provided an exception from the requirements of the Safety Appliance Acts, Congress did not and could not envision that the equipment used in these operations would be modified for the purposes of hauling passengers, which FRA has discovered with regard to four-wheel coal cars. Consequently, the final rule makes clear that FRA will except only freight operations or other non-passenger operations that employ the types of equipment contained in these amendments.

The final rule also retains the proposed movement of the provisions related to drawbars from part 232, where they are currently contained, to this part. FRA believes that part 231 is a more logical place for the drawbar provisions to be located as they are not a brake system component but a generic safety appliance. Although the final rule adopts the drawbar provisions as proposed, the changes made to the language of those provisions when proposed in the NPRM were for clarity and readability and were not intended to change any of the basic drawbar requirements contained in part 232.

49 CFR Part 232

Subpart A—General

Section 232.1 Purpose and Scope

Paragraph (a) contains a formal statement of the final rule's purpose and scope. FRA intends the final rule to cover all brake systems and brake components used in all freight train operations and all other non-passenger train operations.

Paragraph (b) contains the dates upon which railroads covered by this part will be required to comply with the requirements contained in this final rule. FRA recognizes the interrelationship between the proper training of railroad personnel and implementation of many of the inspection, testing, and maintenance requirements contained in the final rule. FRA realizes that in order for railroads to comply with many of the requirements related to the inspection, testing, and maintenance of equipment and the requirements regarding the movement of defective equipment, the railroad and its contractors must first be provided sufficient time to assess its current training program and develop and implement a training program consistent with the requirements of this part. The railroad or contractor then needs time to provide the necessary training to its employees without causing manpower shortages in its operations. FRA also recognizes that the costs of the training requirements are somewhat substantial and may prevent a railroad or contractor from completing the necessary training in a short period of time. Therefore, this final rule provides railroads and contractors with three years to develop and implement the required training. This period is consistent with the time requested by the AAR and other railroads. It is also consistent with the requirement to provide refresher training at least every three years and will allow a railroad or contractor to have one-third of its inspection forces receive the necessary refresher training each year after the initial training period is complete. Consequently, FRA will require compliance with all the requirements contained in § 232.15, subpart B,

subpart C, and subpart F of this final rule at the conclusion of the three-year period provided for conducting the required training.

This paragraph makes clear that the maintenance requirements contained in subpart D will become applicable to all railroads to which this part applies approximately six months after the issuance of this final rule. Virtually all of the requirements contained in this subpart are existing regulatory requirements or prevailing industry practice, and FRA sees no reason to significantly delay their implementation. FRA notes that this subpart requires certain tasks to be performed by a ''qualified person'; however, FRA will not subject railroads to the qualification and training requirements contained in this final rule for individuals performing these tasks until the conclusion of the three-year period provided for conducting the required training.

This paragraph also clarifies that the general provisions contained in subpart A of this final rule regarding applicability, definitions, waivers, responsibility for compliance, penalties, preemptive effect, special approval procedures, availability of records, and information collection will become applicable approximately sixty days after the issuance of this final rule. Due to the enforcement implications connected with these provisions, it is both necessary and desirable to have the provisions become applicable as quickly as possible.

This paragraph also makes clear that the requirements related to end-of-train devices contained in subpart E become applicable to all trains operating on track which is part of the general system of transportation approximately sixty days after issuance of the final rule. As the requirements related to these devices have existed for a number of years and because this final rule modifies those requirement to a very limited extent, FRA believes that railroads should have no problem complying with the requirements in this subpart in the period of time provided. Furthermore, the requirements contained in this subpart apply to both freight and passenger trains that operate on the general system of transportation and are not contingent on the performance of additional training.

FRA also recognizes that there are certain aspects of this final rule that provide operational flexibility to the railroads. Due to this flexibility, FRA believes that some railroads will desire the authority to comply with the final rule as soon as their employees have been properly trained. Therefore, paragraph (c) contains a provision which allows a railroad to notify FRA in writing that it is willing to begin compliance with the requirements of the final rule sometime earlier than the three years provided. However, FRA wishes to make clear that it does not intend for railroads to take advantage of the flexibility provided under some of the provisions of the final rule unless the railroad is willing to comply with all the requirements contained in the final rule.

Paragraph (d) of this section clarifies that any railroad that operates on the general railroad system of transportation that is not operating pursuant to the requirements contained in this final rule or the requirements contained in the Passenger Equipment Safety Standards at 49 CFR part 238, shall continue to comply with the requirements contained in part 232 as it existed prior to the issuance of this final rule, which have been moved to Appendix B of the new part 232. Thus, a railroad will continue to be subject to the existing inspection, testing, and maintenance provisions contained in part 232 until the railroad is required to operate under the provisions of this final rule (*i.e.* three years for most requirements) or until the railroad voluntarily commits to operate under the provisions of this final rule, whichever comes first. FRA also intends for operations and trains which currently operate under the existing part 232 to continue to operate pursuant to those provisions if the operation is not addressed by either this final rule or part 238. It should be noted that FRA does not intend to extend the coverage of part 232 beyond the types of operations that are currently subject to the requirements of part 232. Thus, FRA has explicitly excluded railroads that operate only on track inside an installation that is not part of the general railroad system of transportation, rapid transit operations that are not connected with the general system, and operations specifically excluded by statute.

Section 232.3 Applicability

As a general matter, paragraph (a) of this section establishes that this final rule applies to all railroads that operate freight or other non-passenger train service on standard gage track which is part of the general railroad system of transportation. In paragraph (b) of this section, FRA makes clear that subpart E of this final rule applies to all trains that operate on the general system regardless of whether the train is a freight or passenger train, unless it is specifically excepted by the provisions contained in subpart E. Subpart E contains the requirements regarding the use of two-way end-of-train devices which were issued on January 2, 1997 and became effective on July 1, 1997. Although the final rule contains some minor changes to these requirements, principally for clarification, the provisions contained in Subpart E are very similar to the existing requirements.

Paragraph (c) of this section contains a listing of those operations and equipment to which FRA does not intend this final rule to apply. These include: rapid transit operations not connected to the general system; commuter, intercity, and other short-haul passenger operations; and tourist, scenic, historic, or excursion operations. In 1994, FRA issued a power brake NPRM in which FRA attempted to draft a proposal covering all railroad operations. FRA received a multitude of comments suggesting that similar treatment of passenger and freight operations was not a viable approach due to the significant differences in the operating environment and equipment used in these operations. Based on these comments, FRA decided to separate passenger and freight operations and FRA recently addressed the power brake issues related to passenger and commuter operations in a separate final rule specifically tailored to those types of operations. *See* 64 FR 25540. Similarly, the Federal Railroad Safety Authorization Act of 1994 directs FRA to examine the unique circumstances of tourist and historic railroads when establishing safety regulations. The Act, which amended 49 U.S.C. 20103, states that:

> In prescribing regulations that pertain to railroad safety that affect tourist, historic, scenic, or excursion railroad carriers, the Secretary of Transportation shall take into consideration any financial, operational, or other factors that may be unique to such railroad carriers. The Secretary shall submit a report to Congress not later than September 30, 1995, on actions taken under this subsection.

Pub. L. 103–440, § 217, 108 Stat. 4619, 4624, November 2, 1994.

In response to this mandate, FRA submitted a report to Congress on June 11, 1996, outlining FRA's efforts to tailor its rail safety requirements to tourist, historic, scenic, and excursion railroads. Notably, FRA has established a Tourist and Historic Railroads Working Group formed under RSAC to specifically address the applicability of FRA's regulations to these unique types of operations. Consequently, any requirements issued by FRA for these types of operations will be part of a separate rulemaking proceeding. However, this final rule makes clear that

the provisions of part 232 as they existed prior to this issuance of this rule will continue to apply to such operations that are currently required to comply with the requirements in order to avoid regulatory gaps while power brake provisions for such service are finalized. Part 232 as it existed prior to the issuance of this final rule is contained as appendix B to this new part 232.

Similar to the amendments made to part 231, paragraphs (c)(6)–(c)(8) of this section also contain the express exceptions currently contained in the statute for certain coal cars and logging cars. These provisions are intended to make the regulatory exceptions consistent with the exceptions contained in the statute. The exceptions are taken directly from 49 U.S.C. 20301 (previously codified at 45 U.S.C. 6). As was done in these amendments to part 231, the words ''freight and other non-passenger trains'' have been added to the exceptions in order to remain consistent with Congress' intent when the statutory exceptions were created. At the time that Congress created an exception from the requirements of the Safety Appliance Acts, Congress did not and could not envision that the equipment used in these operations would be modified for the purposes of hauling passengers, which FRA has discovered with regard to four-wheel coal cars. Consequently, FRA will only except freight and other non-passenger operations which employ the types of equipment contained in these amendments.

Paragraph (d) of this section revokes the Interstate Commerce Commission Order 13528, of May 30, 1945, as amended (codified in existing § 232.3 and appendix B to part 232), and codifies some of the relevant provisions of that Order. Thus, paragraph (d) of this section contains a list of pieces of equipment that were excepted from the Order's specifications and requirements for operating power-brake systems for freight service. FRA believes that the Order is no longer completely relevant or necessary and believes that the relevant provisions should be incorporated into this section. In addition, FRA references current industry standards containing performance specifications for freight power brakes in other portions of this final rule which mirror the provisions contained in the Order. FRA notes that locomotives were removed from the listing as this final rule contains various requirements which address locomotives.

It should be noted that paragraph (a) of this section contains a specific reference to private cars and circus trains. As private cars are designed to carry passengers and are generally hauled in both freight and passenger trains, FRA intends that these types of cars be covered by both the recently issued Passenger Equipment Safety Standards and this final rule. For example, these types of cars will be subject to the maintenance and equipment standards applicable to passenger equipment but will be covered by the inspection requirements contained in this final rule when hauled in a freight train. With regard to circus trains, FRA intends for these operations to be covered by this final rule due to the unique nature of this equipment and operations. Although a circus train carries some employees, the majority of the train is composed of freight-type equipment and is operated in a manner similar to a freight train. Thus, for consistency purposes, FRA intends that this final rule apply to circus train operations.

Section 232.5 Definitions

This section contains an extensive set of definitions. FRA intends these definitions to clarify the meaning of important terms as they are used in the text of the final rule. The definitions are carefully worded in an attempt to minimize the potential for misinterpretation of the rule. The final rule retains most of the definitions proposed in the NPRM; however, based on the comments received a few new definitions have been added and other definitions previously included in the NPRM have been slightly modified for clarity. Several of the definitions introduce new concepts or new terminologies which require further discussion. The following discussion is arranged in the order in which the definitions appear in the rule text.

''Brake indicator'' means a device, actuated by brake cylinder pressure, which indicates whether brakes are applied or released on a car. The use of brake indicators in the performance of brake tests is a controversial subject. Rail labor organizations correctly maintain that brake indicators are not fully reliable indicators of brake application and release on each car in the train. Further, railroads correctly maintain that reliance on brake indicators is necessary because inspectors cannot always safely observe brake application and release. FRA believes that brake indicators can serve an important role in the performance of brake tests, particularly in those instances where the design of the equipment requires inspectors to place themselves in potentially dangerous position in order to observe the brake actuation or release.

The definition of ''effective brake'' has been slightly modified from the definition proposed in the NPRM. The modification clarifies that a car's air brake will not be considered effective if its piston travel exceeds the specified limits or if it is not capable of producing its designed retarding force. FRA believes this clarifying language is necessary to address the concerns raised by certain commenters regarding the definitions of ''bind'' and ''foul'' contained in this final rule. The definitions of ''bind'' and ''foul'' have been retained as proposed in the NPRM. Contrary to the assertions made by some commenters, FRA believes that the definitions are sufficiently clear. Certain commenters contend that the definitions of these terms fail to address every possible condition that could affect the proper operation of a brake system. FRA believes that the conditions noted by several commenters as not being covered by these definitions are sufficiently covered by the clarified definition of ''effective brake'' contained in this final rule. Thus, even though a condition may not cause a brake to ''bind'' or ''foul'' the condition would cause the brake not to be an ''effective brake'' as defined in the final rule. Furthermore, FRA does not believe that the definitions of ''bind'' or ''foul'' are overly broad, as suggested by some commenters, since the restrictions addressed are ones which affect the intended movement of a component. Therefore, if the restriction is one that does not restrict the component's intended movement, then it should not be considered to ''bind'' or ''foul.''

The final rule also includes a definition of ''inoperative dynamic brake'' which was not specifically contained in the NPRM. This definition has been added in response to comments that the term ''ineffective dynamic brake'' contained in the NPRM was unclear and could lead to potential misunderstandings. These commenters contended that the rule should use the term ''inoperative dynamic brake'' and that its definition should be consistent with the definition of ''inoperative brake.'' FRA agrees with these comments and thus, the final rule replaces the term ''ineffective dynamic brakes'' with the term ''inoperative dynamic brake.'' The term ''inoperative dynamic brake'' means any dynamic brake that no longer provides its designed retarding force on the train, for whatever reason. FRA agrees that the use of only this term clarifies the applicability of the requirements related

to dynamic brakes and prevents potential misunderstandings.

The final rule also defines the term ''initial terminal'' to mean the location where a train is originally assembled. This definition is consistent with the definition contained in the existing power brake regulations. Furthermore, the final rule eliminates the term ''point of origin'' proposed in the NPRM. FRA agrees that the proposed definition of this term was duplicative of the term ''initial terminal'' and merely created potential misunderstandings. Moreover, FRA agrees that the problems attempted to be addressed by the use of this term are sufficiently addressed by the various inspections required in this final rule when adding cars to a train.

The concept of ''ordered date'' or ''date ordered'' is vital to the correct application of this final rule. The terms mean the date on which notice to proceed is given by a procuring railroad to a contractor or supplier for new equipment. Some of the provisions of the final rule apply only to newly constructed equipment. When FRA applies a requirement only to equipment ordered on or after a specified date or placed in service for the first time on or after a specified date, FRA intends to exempt from the requirement, or ''grandfather'' any piece of equipment that is both ordered and placed in service for the first time before that date. FRA believes this approach will allow railroads to minimize, or avoid altogether, any costs associated with changing existing purchase orders and yet limit the delay in realizing the safety benefits of the requirements contained in this final rule.

The definitions of ''qualified person'' and ''qualified mechanical inspector'' are vital to understanding the inspection, testing, and maintenance provisions contained in this final rule. In order to ensure a proper understanding of these terms, the final rule clarifies FRA's intent regarding the necessary training these individuals are to receive and further clarifies the designation of such individuals. Although FRA disagrees with the assertions of some commenters that a ''qualified person'' should only be able to perform a limited number of tasks required by this final rule, FRA does agree that the definition of ''qualified person'' contained in the NPRM was overly vague and was susceptible to abuse and misunderstanding. Therefore, this final rule modifies the definition of a ''qualified person'' in order to more fully develop what is required by a railroad when designating a person as qualified to perform a particular task.

The definition of ''qualified person'' contained in this final rule makes clear that the person is to receive training pursuant to the training, qualification, and designation program required under § 232.203. The definition also makes clear that although a person may be deemed a ''qualified person'' for the performance of one task, that same person may or may not be considered a ''qualified person'' for the performance of another task. The rule requires that various tasks be performed by a ''qualified person.'' For example, these tasks include the performance of brake inspections, the handling of defective equipment, and the performance of single car tests. FRA would expect employees performing these various tasks to have different levels of training. For example, a person receiving appropriate training to be deemed a ''qualified person'' for the purpose of performing Class II brake tests should not be deemed a ''qualified person'' for the purpose of moving defective equipment or performing single car or repair track air brake tests, unless specific training is provided that individual which specifically covers those tasks. The final rule stresses that the individual must have received appropriate training to perform the task for which the railroad is assigning the person responsibility.

Contrary to the assertions of certain commenters, FRA does not intend for term ''qualified person'' to be synonymous with the term train crew member. Although the NPRM discussed the fact that a train crew member could be considered a ''qualified person'' for performing many of the brake inspections required by the rule, FRA does not intend for a train crew member to be deemed a ''qualified person'' for performing every task covered by this final rule which is to be performed by a ''qualified person.'' There are various tasks covered by this final rule (*i.e.,* single car and repair track air brake test) that must be performed by a ''qualified person'' which would require an individual to receive more specialized and in-depth training than that received by a person strictly performing brake inspections. For some tasks a ''qualified person'' may have to be an individual in the railroad's repair or mechanical department. The final rule makes clear that the railroad is responsible for determining that the person has the knowledge and skills necessary to perform the required function for which the person is assigned responsibility and for maintaining sufficient records documenting this knowledge and skill.

The final rule also retains the proposed definition of ''qualified mechanical inspector'' (QMI) with slight modification to ensure clarity and avoid potential misunderstanding. The final rule defines a QMI as a ''qualified person'' who as a part of the training, qualification, and designation program required under § 232.203 has received instruction and training that includes ''hands-on'' experience (under appropriate supervision or apprenticeship) in one or more of the following functions: trouble-shooting, inspection, testing, maintenance, or repair of the specific train brake components and systems for which the inspector is assigned responsibility. This person shall also possess a current understanding of what is required to properly repair and maintain the safety-critical brake components for which the person is assigned responsibility. Further, a QMI shall be a person whose primary responsibility includes work generally consistent with the above-referenced functions.

The definition contained in this final rule clarifies the intent of the NPRM by specifically stating that a QMI must be properly trained and have a primary responsibility in the function of trouble-shooting, inspection, testing, maintenance, or repair of the specific train brake systems for which the inspector is assigned responsibility. The definition also clarifies that a QMI must possess a current understanding of what is required to properly repair and maintain the safety-critical brake or mechanical components for which the person is assigned responsibility. The concept of QMI is premised on the idea that railroads will be permitted to move trains extended distances between brake inspections if the trains are inspected by highly qualified individuals. As no trains are currently permitted to move the distances between brake inspections permitted by this rule, FRA believes that the inspections these trains receive must be of very high quality and must be performed by individuals who can not only identify a particular defective condition but who have the knowledge and experience to know how the particular defective condition affects other parts of the brake system or mechanical components and who have an understanding of what might have caused a particular defective condition. FRA also believes that in order for a person to become highly proficient in the performance of a particular task that person must perform the task on a repeated and consistent basis. As it is almost impossible to develop and impose specific experience requirements, FRA believes that a requirement that the person's primary

responsibility be in one or more of the specifically identified work areas and that the person have a basic understanding of what is required to properly repair and maintain safety-critical brake components is necessary to ensure the high quality inspections envisioned by the rule.

In order to clarify the meaning of ''primary responsibility'' as used in the definition of QMI, the final rule contains a definition of the term. As a rule of thumb FRA will consider a person's ''primary responsibility'' to be the task that the person performs at least 50 percent of the time. Therefore, a person who spends at least 50 percent of the time engaged in the duty of either inspecting, testing, maintaining, troubleshooting, or repairing train brakes systems may be designated as a QMI; provided, the person is properly trained to perform the tasks assigned and possesses a current understanding of what is required to properly repair and maintain the safety-critical brake components for which he or she is assigned responsibility. However, FRA will consider the totality of the circumstances surrounding an employee's duties in determining a person's ''primary responsibility.'' For example, a person may not spend 50 percent of their day engaged in any one readily identifiable type of activity; in those situations FRA will have to look at the circumstances involved on a case-by-case basis.

The definition of QMI largely rules out the possibility of train crew members being designated as these highly qualified inspectors since the primary responsibility, as defined above, of virtually all current train crew personnel is the operation of trains and for the most part train crew personnel do not possess a current understanding of what is required to properly repair and maintain the safety-critical brake components that are inspected during the various required brake tests. FRA provides a clear definition of qualified mechanical inspector so that a differentiation can be made between the comprehensive knowledge and training possessed by a professional mechanical employee, and the more specialized training and general knowledge possessed by train crews. FRA intends the definition to allow the members of the trades associated with the testing and maintenance of equipment such as carmen, machinists, and electricians to become qualified mechanical inspectors. However, membership in labor organizations or completion of apprenticeship programs associated with these crafts is not required to be a qualified mechanical inspector. The two primary qualifications are possession of the knowledge required to do the job and a primary work assignment inspecting, testing, maintaining, troubleshooting, or repairing the equipment.

The definition of ''solid block of cars'' has been modified from that proposed in the NPRM. Although FRA believes the definition it proposed is consistent with current interpretations and enforcement of the existing requirement, FRA agrees with some of the commenters that the definition may have been too narrow and did not directly address FRA's primary concern, the block of cars itself. Rather than attempt to limit the addition of certain blocks of cars to a train by requiring that the entire train be reinspected if the block of cars is not composed of cars from only one other train, the final rule specifically addresses the inspection of a ''solid block of cars'' in the various inspection provisions based on the composition of the block. Thus, the final rule defines a ''solid block of cars'' as two or more freight cars consecutively coupled together and added to a train as a single unit. As FRA's primary concern is the condition of the block of cars being added to the train especially when the block of cars is made up of cars from more than one train, the final rule will permit a solid block of cars to be added to a train without triggering a requirement to perform a Class I brake test on the entire train. However, depending on the make-up of that block of cars, certain inspections will have to be performed on that block of cars at the location where it is added to the train. Therefore, the final rule places the emphasis on the inspection of the cars being added to the train rather than requiring a complete reinspection of the entire train.

The final rule also adds a definition of ''unit train'' and ''cycle train'' in order to clarify the requirement regarding the performance of a Class I brake test on such a train every 3,000 miles. Although the preamble to the NPRM made clear that this requirement was intended to apply to trains that are operated in captive service, the proposed rule text failed to specifically identify which trains were required to receive such attention. Thus, in order to remain consistent with FRA's intent, the final rule text has been modified to include the term ''unit or cycle train.'' ''Unit train'' or ''cycle train'' means a train that, except for the changing of locomotive power and the removal or replacement of defective equipment, remains coupled as a consist and continuously operates from location A to location B and back to location A. These trains are also referred to as captive service trains as they basically operate in one continuous loop. Currently, trains which operate in this fashion can operate almost indefinitely on one initial terminal inspection and then a continuing series of 1,000-mile inspections. FRA believes that it is necessary for these trains to receive comprehensive brake inspections on a periodic basis in order to ensure their safe and proper operation.

The definitions of ''transfer train'' and ''switching service'' are somewhat interrelated since the determination as to whether, at a minimum, a transfer train brake test is required is based on whether the movement is a switching movement or a train movement. It is noted that the definition of ''yard train'' contained in the NPRM has been eliminated from this final rule. As the term was not used in the NPRM and has not been used in this final rule, FRA finds no need to retain the definition. Furthermore, the determination as to whether or not a yard train is required to be inspected and tested as a transfer train is based on whether the train is engaged in a train movement.

The final rule slightly modifies the proposed definition of ''transfer train'' to clarify that such a train may pick up and deliver freight equipment while en route to its destination. Such activity is currently conducted by these trains, and it was not FRA's intent when issuing the NPRM to prohibit these trains from being used in this fashion. The final rule also retains the definition of ''switching service,'' which is defined as the classification of cars according to commodity or destination; assembling of cars for train movements; changing the position of cars for purposes of loading, unloading, or weighing; placing of locomotives or cars for repair or storage; or moving of rail equipment in connection with work service that does not constitute a train movement. Thus, a train engaged in switching service carries the potential of becoming a transfer train, subject to a transfer train's testing requirements, if the movement it will be engaged in is considered a ''train movement'' rather than a ''switching movement.'' FRA's determination of whether the movement of cars is a ''train movement,'' subject to the requirements of this section, or a ''switching movement'' is and will be based on the voluminous case law developed by various courts of the United States.

FRA's general rule of thumb as to whether a trip constitutes a ''train movement'' requires five or more cars coupled together that are hauled a distance of at least one mile without a

stop to set off or pick up a car and not moving for the purpose of assembling or disassembling a train. However, FRA may consider movements of less than one mile ''train movements'' if various circumstances exist. In determining whether a particular movement constitutes a ''train movement,'' FRA conducts a multi-factor analysis based upon the discussions contained in various court decisions on the subject. *See e.g. United States* v. *Seaboard Air Line R. R. Co.,* 361 U.S. 78 (1959); *Louisville & Jeffersonville Bridge Co.* v. *United States,* 249 U.S. 543 (1919). The following factors are taken into consideration by FRA: The purpose of the movement; the distance traveled without a stop to set out or pick up cars; the number of cars hauled; and the hazards associated with the particular route traveled (*e.g.,* the existence of public or private crossings with or without crossing protection, the steepness of the grade, the existence of curves, any other conditions that minimize the locomotive engineer's sight distance, and any other conditions that may create a greater need for power brakes during the movement). The existence of any of these hazards would tend to weigh towards the finding of a ''train movement,'' since these are the types of hazards against which the power brake provisions of the Federal rail safety laws were designed to give protection.

Section 232.7 Waivers

This section sets forth the procedures for seeking waivers of compliance with the requirements of this rule. Requests for such waivers may be filed by any interested party. In reviewing such requests, FRA conducts investigations to determine if a deviation from the general criteria can be made without compromising or diminishing rail safety.

Section 232.9 Responsibility for Compliance

General compliance requirements are contained in this section. In accordance with the ''use'' or ''haul'' language previously contained in the Safety Appliance Acts (49 U.S.C. chapter 203), and with FRA's general rulemaking authority under the Federal railroad safety laws, the final rule retains the proposed requirement that any train, railroad car, or locomotive covered by this part will be considered ''in use'' prior to departure but after it receives or should have received the necessary tests and inspections required for movement. FRA will no longer necessarily wait for a piece of equipment with a power brake defect to be hauled before issuing a violation report and recommending a civil penalty, a practice frequently criticized by the railroads. FRA believes that this approach will increase FRA's ability to prevent the movement of defective equipment that creates a potential safety hazard to both the public and railroad employees. FRA does not feel that this approach increases the railroads' burden since equipment should not be operated if it is found in defective condition in the pre-departure tests and inspections, unless permitted by the regulations. In fact, this modification of FRA's perspectives as to when a piece of equipment will be considered ''in use'' was fully discussed by members of the Working Group and representatives of both rail labor and rail management supported this approach, agreeing that the current practice of waiting for a defective piece of equipment to depart from a location does very little to promote or ensure the safety of trains. FRA received no comments objecting to this approach in response to the NPRM.

FRA currently interprets the ''use'' or ''haul'' language previously contained in the Safety Appliance Acts narrowly to require that a train or car not in compliance with the power brake regulations actually engage in a train movement before a violation under the power brake regulations could be assessed against a railroad. Although this interpretation is in accordance with existing case law, FRA believes that a broader interpretation is possible based upon the case law interpreting the ''use'' language contained in the Safety Appliance Acts and based upon FRA's general rulemaking authority under the Federal railroad safety laws. Based upon both these authorities, FRA finds that it is not necessary to require that a train or car engaged in a train movement prior to FRA assessing a violation under the power brake regulations. The fact that the train or car is being used by a railroad, has been or should have been inspected by the railroad, and will be engaged in a train movement while in non-compliance with the requirements contained in this part is sufficient to allow a violation to be assessed.

This section also clarifies FRA's position that the requirements contained in these rules are applicable to any ''person,'' as broadly defined in § 232.11, that performs any function required by the proposed rules. Although various sections of the final rule address the duties of a railroad, FRA intends that any person who performs any action on behalf of a railroad or any person who performs any action covered by the final rule is required to perform that action in the same manner as required of a railroad or be subject to FRA enforcement action. For example, private car owners and contract shippers that perform duties covered by these regulations would be required to perform those duties in the same manner as required of a railroad.

Paragraph (c) states that any ''person'' as broadly defined in § 232.11, that performs any function or task required by this part will be deemed to have consented to FRA inspection of the person's operation to the extent necessary to ensure that the function or task is being performed in accordance with the requirements of this part. This provision was contained in the NPRM, and FRA received no comments opposing the position. This provision is intended to put railroads, contractors, and manufacturers that elect to perform tasks required by this part on notice that they are consenting to FRA's inspection for rail safety purposes of that portion of their operation that is performing the function or task required by this part. In most cases, this function or task involves a contractor's performance of certain required brake inspections or the performance of specified maintenance on cars, such as conducting single car or repair track tests on behalf of a railroad. FRA believes that if a person is going to perform a task required by this part, FRA must have the ability to view the performance of such a task to ensure that it is conducted in compliance with federal regulations. Without such oversight, FRA believes that the requirements contained in this the regulation would become illusory and could be easily circumvented by some railroads. FRA believes that it has the statutory authority pursuant to 49 U.S.C. 20107 to inspect any facility or operation that performs functions or tasks required under this part, and this provision is merely intended to make that authority clear to all persons performing such tasks or functions.

Section 232.11 Penalties

This section identifies the penalties that may be imposed upon a person, including a railroad or an independent contractor providing goods or services to a railroad, that violates any requirement of this part. These penalties are authorized by 49 U.S.C. 21301, 21302, and 21304. The penalty provision parallels penalty provisions included in numerous other safety regulations issued by FRA. Essentially, any person who violates any requirement of this part or causes the violation of any such requirement will be subject to a civil penalty of at least $500 and not more than $11,000 per violation. Civil penalties may be

assessed against individuals only for willful violations, and where a grossly negligent violation or a pattern of repeated violations creates an imminent hazard of death or injury to persons, or causes death or injury, a penalty not to exceed $22,000 per violation may be assessed. In addition, each day a violation continues will constitute a separate offense. It should be noted that, the Federal Civil Penalties Inflation Adjustment Act of 1990, Pub. L. 101–410 Stat. 890, 28 U.S.C. 2461 note, as amended by the Debt Collection Improvement Act of 1996 Pub. L. 104–134, April 26, 1996 required agencies to adjust for inflation the maximum civil monetary penalties within the agencies jurisdiction. See 63 FR 11623. The resulting $11,000 and $22,000 maximum penalties noted in this section were determined by applying the criteria set forth in sections 4 and 5 of the statute to the maximum penalties otherwise provided for in the Federal railroad safety laws. Finally, paragraph (b) makes clear that a person may be subject to criminal penalties under 49 U.S.C. 21311 for knowingly and willfully falsifying reports required by these regulations. FRA believes that the inclusion of penalty provisions for failure to comply with the regulations is important in ensuring that compliance is achieved.

The final rule includes a schedule of civil penalties in appendix A to this part. Because such penalty schedules are statements of policy, notice and comment were not required prior to its issuance. See 5 U.S.C. 553(b)(3)(A).

Section 232.13 Preemptive Effect

This section informs the public as to FRA's intention regarding the preemptive effect of the final rule. While the presence or absence of such a section does not conclusively establish the preemptive effect of a final rule, it informs the public concerning the statutory provisions which govern the preemptive effect of the rule and FRA's intentions concerning preemption. Paragraph (a) points out the preemptive provision contained in 49 U.S.C. 20106, which provides that all regulations prescribed by the Secretary relating to railroad safety preempt any State law, regulation, or order covering the same subject matter, except a provision necessary to eliminate or reduce an essentially local safety hazard that is not incompatible with a Federal law, regulation, or order and that does not unreasonably burden interstate commerce. With the exception of a provision directed at an essentially local safety hazard that is not inconsistent with Federal law, regulation, or order and that does not unreasonably burden interstate commerce, 49 U.S.C. 20106 will preempt any State regulatory agency rule covering the same subject matter as the regulations contained in this final rule.

Paragraph (b) of this section also informs the public of the potential for preemption under various other statutory and constitutional provisions. These include: the Locomotive Inspection Act (now codified at 49 U.S.C. 20701–20703), the Safety Appliance Acts (now codified at 49 U.S.C. 20301–20304), and the Commerce Clause. FRA is not expressing positions as to whether or to what extent preemption exists with regard to any of the provisions noted above because doing so requires a lengthy analysis for each component which, in the aggregate, would be so long as to impair the usefulness of this document for most readers. As FRA lacks the authority to make binding preemption determinations, FRA's purpose in identifying these provisions is merely to inform the public of the existence of these provisions and that voluminous case law exists regarding preemption under each of the provisions.

Paragraph (c) further informs the public that FRA does not intend to preempt provisions of State criminal law that impose sanctions for reckless conduct that leads to actual loss of life, injury, or damage to property, whether such provisions apply specifically to railroad employees or generally to the public at large.

Section 232.15 Movement of Defective Equipment

This section contains the provisions regarding the movement of equipment with defective brakes without civil penalty liability. Except as noted in the discussion below, the provisions contained in this section are almost identical to the provisions proposed in the 1998 NPRM and incorporate the stringent conditions currently contained in 49 U.S.C. 20302, 20303, 21302, and 21304 (previously codified at 45 U.S.C. 13). The language used in some of the provisions has been slightly modified to ensure consistency with existing statutory requirements. As pointed out in the previous discussion, most of the alternative proposals received by FRA in response to the 1994 NPRM, the subsequent RSAC Working Group meetings, and the 1998 NPRM all contained provisions regarding the movement of equipment with defective brakes which are in direct conflict with the statutory requirements. *See* ''Overview of Comments and General FRA Conclusions'' portion of the preamble under the heading ''Movement of Equipment with Defective Brakes.'' FRA continues to believe that the requirements related to the movement of equipment with defective brakes retained in this final rule are not only consistent with the statutory requirements, but also ensure the safe and proper movement of defective equipment and clarify the duties imposed on a railroad when moving such equipment.

Paragraph (a) of this section contains various parameters which must exist in order for a railroad to be deemed to be hauling a piece of equipment with defective brakes for repairs without civil penalty liability. The final rule modifies the language used in some of the proposed general provisions contained in this paragraph to accurately reflect the language contained in the existing statutory provisions pertaining to the movement of equipment with defective brakes. The final rule replaces the term ''repair location'' with the phrase ''location where necessary repairs can be performed.'' FRA agrees with the comments of certain labor representatives that the proposed language could have been interpreted as being somewhat contrary to the language used in the existing statute, which was not FRA's intent.

The vast majority of the requirements contained in this paragraph should pose absolutely no additional burden to railroads as they are merely a codification of existing statutory requirements. The only requirement being retained from the 1998 NPRM in this paragraph that is not currently mandated is the requirement that all cars or locomotives found with defective or inoperative braking equipment be tagged as bad ordered with a designation of the location where the necessary repairs can and will be effectuated and that a qualified person determine the safety parameters for moving a piece of defective equipment. Although these are new requirements, most railroads already tag defective brake equipment upon discovery of the defect. It should be noted that the final rule clarifies that the person required to make the determinations regarding the safe movement of defective equipment is to be a ''qualified person'' as defined in the final rule. The intent of FRA when issuing the NPRM was to require the determinations to be made by these individuals. FRA believes that the training requirements contained in the final rule for designating a person qualified to perform a specific task will ensure that the individual possesses the appropriate knowledge and skills to

perform the assigned task. Furthermore, the determinations that are required to be made in the final rule are currently made by individuals who FRA believes will be trained and designated under the final rule as qualified persons.

In paragraph (a), FRA retains the existing and proposed requirement that equipment with defective brakes shall not depart from or be moved beyond a location where the necessary repairs to the equipment can be performed. Therefore, if a car or locomotive is found with defective brakes during any of the proposed brake inspections or while the piece of equipment is en route and the location where the defective equipment is discovered is a place where repairs of the type needed can be performed, that car or locomotive shall not be moved from that location until the necessary repairs are effectuated. However, if repairs to the defective condition cannot be performed at the location where the defect is discovered, or should have been discovered, the final rule makes clear that the railroad is permitted to move the equipment with the defective condition only to the nearest location where the necessary repairs can be performed.

Paragraph (a) also retains the proposed codification and clarification of the statutory restrictions on the movement of equipment with defective brakes onto the line of a connecting railroad. Hence, the delivery of defective equipment in interchange is covered by these restrictions. In addition to fulfilling the other requirements set out in this section, a railroad seeking relief from civil penalty liability must show that the connecting railroad has elected to accept the non-complying equipment and that the point of repair on the connecting railroad's line, where the equipment will be repaired, is no further than the point where the repairs could have been made on the line where the equipment was first found to be defective.

Paragraph (b) of this section contains the specific requirements regarding the tagging of equipment found with defective brake components. The requirements contained in this paragraph are very similar to the tagging requirements proposed in the NPRM and those currently contained in part 215, regarding the movement of equipment not in compliance with the Freight Car Safety Standards, and are generally consistent with how most railroads currently tag equipment found with defective brakes. The final rule retains the proposed requirement that a record or copy of each tag removed from a defective piece of equipment be retained for 90 days and made available to FRA within 15 days of request. FRA does not believe that the proposed time frames need to be expanded as suggested by some commenters. The provisions are identical to those contained in part 215, regarding freight car defects and they have proven to be sufficient to meet the needs of FRA. The record keeping requirements are intended to aid FRA in its enforcement of the regulations. As the agency is able to inspect and oversee only a small portion of the railroad operations taking place across the country at any one time, the need for railroads to maintain records of such operations is essential for FRA to carry out its mission of ensuring that all railroads are operating in the safest possible manner and that they comply with those minimum Federal standards designed to ensure that safety.

Paragraph (b) also recognizes that the industry may attempt to develop some type of automated tracking system capable of retaining the information required by this section and tracking defective equipment electronically. Thus, this paragraph permits the use of an automated tracking system in lieu of directly tagging the equipment if the automated system is approved for use by FRA. Contrary to the recommendations of some commenters, FRA is not willing to permit the implementation of an automated tracking system without its approval. As an adequate automated system for tracking defective equipment does not currently exist on most railroads, FRA does not believe it is prudent, from a safety perspective, to allow implementation of a tracking system for which FRA would not have a prior opportunity to assess to ensure the system's accessibility, security, and accuracy. Furthermore, FRA tends to agree with the assertion of various labor representatives that the physical tagging of defective equipment provides a railroad's ground and operational forces the ability to visually locate and identify defective equipment at the time they see it rather than referring to an electronic database for such information.

This paragraph also contains language not previously included in the NPRM regarding FRA's oversight of an automated tracking system that is approved by FRA. FRA believes these provisions as necessary to ensure the agency's ability to monitor such systems and potentially prohibit the use of the system if it is found deficient. The provisions make clear that an automated tracking system approved for use by FRA be capable of being reviewed and monitored by FRA at any time. This paragraph also notifies the railroads that FRA reserves the right to prohibit the use of a previously approved automated tracking system if FRA subsequently finds it to be insecure, inaccessible, or inadequate. Such a determination would have to be in writing and include the basis for taking such action.

Paragraph (c) retains the proposed provision restricting the movement of a vehicle with defective brakes for the purpose of unloading or purging only if it is necessary for the safe repair of the car. This restriction is fully consistent with the statutory provisions regarding the movement of equipment with defective safety appliances.

Paragraph (d) retains with slight modification the method of calculating the percentage of operative power brakes (operative primary brakes) in a train that was proposed in the NPRM. This paragraph retains the general method of calculating the percentage on a control valve basis. However, FRA agrees with the comments of the NTSB and certain labor representatives that the method proposed in the NPRM did not take into consideration the possibility of a control valve being cut in when the brakes it controls are inoperative. Therefore, this final rule clarifies that a control valve will not be considered cut-in if the brakes controlled by that valve are inoperative. Although the statute discusses the percentage of operative brakes in terms of a percentage of vehicles, the statute was written nearly a century ago, and at that time the only way to cut out the brakes on a car or locomotive was to cut out the entire unit. *See* 49 U.S.C. 20302(a)(5)(B). Today, many types of freight equipment can have their brakes cut out on a per-truck basis, and FRA expects this trend to increase as the technology is applied to newly acquired equipment. This final rule merely adopts a method of calculating the percentage of operative brakes in a train based on the design of equipment used today and, thus, a means to more accurately reflect the true braking ability of the train as a whole. FRA believes that this method of calculation is consistent with the intent of Congress when it drafted the statutory requirement and simply recognizes the technological advancements made in braking systems over the last century.

Paragraph (d) also retains the proposed list of conditions that are not to be considered inoperative power brakes for purposes of calculating the percentage of operative brakes. Certain commenters recommended that FRA eliminate the proposed listing of conditions that would not be considered as rendering the brakes inoperative, contending that the listed conditions

should not be excluded from consideration. FRA disagrees with these commenters. The purpose of the calculation is to determine the percentage of operative brakes, and the conditions listed in the proposal and retained in this final rule do not render the power brakes inoperative. Many of the listed conditions constitute a violation under other provisions contained in the final rule or another regulatory provision for which separate penalties are provided.

A cut-out or ineffective power brake is an inoperative power brake, but the failure or cutting out of a secondary brake system does not result in inoperative power brakes; for example, failure of the dynamic brake does not render the power brake inoperative. Furthermore, inoperative handbrakes or power brakes overdue for maintenance or stenciling do not render the power brakes inoperative on the car and should not be deemed inoperative power brakes for purposes of the calculation. The final rule and other regulations contain separate penalties for operating a car that has an inoperative handbrake, is overdue for maintenance, or lacks the proper stenciling or marking if not being properly hauled for repairs. In addition, although a car may be found with piston travel that exceeds the Class I brake test limits, such excess travel does not render the brakes inoperative until the piston travel exceeds the outside limits established for that particular type of piston design. However, piston travel that exceeds the applicable Class I brake test limits would be considered a defective condition if the piston travel were not adjusted at the time that a Class I brake test were performed, and the final rule contains an appropriate penalty for such a condition.

Paragraph (e) contains the requirements regarding the placement of cars in a train that have inoperative brakes. The requirements contained in this final rule are virtually identical to the requirements proposed in the NPRM. The restrictions contained in this paragraph are consistent with current industry practice and are part of almost every major railroad's operating rules. This paragraph prohibits the placing of a vehicle with inoperative brakes at the rear of the train. In addition, this paragraph retains the prohibition on the consecutive placing of more than two vehicles with inoperative brakes, as test track demonstrations have indicated that when three consecutive cars have their brakes cut-out it is not always possible to obtain an emergency brake application on trailing cars. However, as it was FRA's intent to incorporate current industry practice when proposing the requirements, the final rule slightly modifies the requirement regarding the placement of multi-unit articulated equipment. When proposing the restrictions regarding multi-unit articulated equipment, FRA extrapolated the restriction based on the requirements regarding the consecutive placing of defective cars. Based on its consideration of the comments, FRA has determined that the proposed requirement prohibiting the placement of such equipment with consecutive control valves cut out is more restrictive than current practice on many railroads, which was not FRA's intent when drafting the proposal. Consequently, in order to remain consistent with existing industry practice, the final rule requires that such equipment shall not be placed in a train if it has more than two consecutive individual control valves cut out or if the brakes controlled by the valve are inoperative.

Paragraph (f) contains guidelines that FRA will consider when determining whether a location is one where necessary brake repairs can be performed and whether a location is the nearest location where such repairs can be effectuated. The preamble to the NPRM contained an extensive discussion regarding what factors should be considered when determining whether a particular location is one where brake system repairs should be performed and discussed the difficulties and pitfalls associated developing a standard applicable to all situations. *See* 63 FR 48309. In the NPRM, FRA stated that the determinations as to what constitutes a location where necessary repairs can be performed had to be conducted on a case-by-case basis utilizing the criteria established in existing case law. A number of railroad representatives commented on this issue and recommended that FRA further clarify what constitutes a location where brake repairs must be conducted. These commenters claimed that leaving the determination solely to individual FRA inspectors creates inconsistent enforcement and makes it virtually impossible for railroads to comply. AAR and its members recommended that FRA allow railroads to designate locations where brake system repairs would be conducted. Conversely, representatives of rail labor objected to any approach that would permit railroads to designate repair locations, claiming that such an allowance would violate the statutory conditions regarding the movement of defective equipment.

After consideration of these comments, FRA believes it is essential to further clarify to the regulated community what the agency's position will be for determining whether a location is a place where brake repairs are to be conducted. FRA does not agree that a railroad should be permitted to independently determine the locations it will consider capable of making brake system repairs. History shows that many railroads and FRA have widely different views on what should be considered a location where brake repairs can and should be effectuated. Furthermore, it is apparent to FRA that some railroads attempt to minimize or circumvent the requirements for conducting repairs in the name of convenience or efficiency. However, FRA also recognizes that the emergence of mobile repair trucks creates an ability to perform repairs that did not exist when Congress originally enacted the statutory requirements related to the movement of defective equipment. FRA acknowledges that every location where a mobile repair truck is capable of making repairs should not be considered a location where repairs must be conducted. However, FRA also disagrees with the contentions of some commenters that Congress only intended for fixed repair facilities to be considered when determining locations where brake repairs are to be performed and that mobile repair trucks should not be considered. FRA is aware of numerous locations where mobile repair trucks are being used in lieu of a fixed facility or where a fixed facility was eliminated and the repairs that were being performed by the fixed facility are now being performed at the same location with a fully equipped repair truck. Thus, FRA believes that locations where repair trucks are used in virtually the same manner as a fixed facility should be considered when determining whether the location is capable of making the necessary repairs.

As noted in the NPRM, the determination as to what constitutes a location where necessary repairs can be performed is an issue that FRA has grappled with for decades. FRA continues to believe that the determination must be made on a case-by-case basis after conducting a multi-factor analysis. However, in an effort to better detail the items that will be considered by FRA in making a determination, paragraph (f) contains general guidelines that FRA will consider when determining whether a location is one which should be considered a location where at least some brake system repairs must be