Federal Railroad Administration

Track Division
and
Rail and Infrastructure Integrity Division
Compliance Manual

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Bridge Safety Standards

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CHAPTER 1

Bridge Safety Standards

Introduction

This chapter provides additional guidance for FRA inspectors, including State inspectors participating in the Federal program, to facilitate the implementation of the Bridge Safety Standards (BSS) during inspection activities. This manual is not to be construed as a modification, alteration, or revision of the published BSS found in Title 49 Code of Federal Regulations (CFR) Part 237.

Any legal proceeding instituted against a track owner must be based on the regulations found in 49 CFR Part 237. FRA inspectors should refer to this manual as often as necessary to understand the intent of any particular rules, thereby assuring to the extent practicable, the nationally uniform application of these rules as intended by Congress in the Rail Safety Improvement Act of 2008 (RSIA), Public Law 110–432, 122 Stat. 4890 (49 U.S.C. 20103, note).

FRA inspectors will not, under any circumstances, adjust, correct, or repair bridges, or appurtenances; nor authorize, suggest, or recommend any movements over any bridge. Full responsibility for these matters rests with the track owner. The FRA inspector will immediately inform the track owner of any condition not in compliance with the BSS.

This manual is based on the BSS published on July 15, 2010 (see 75 FR 41282). The BSS prescribe minimum safety requirements for the management of railroad bridges that support one or more tracks. Track owners may adopt more stringent standards as long as they are in accordance with the BSS.

FRA inspectors are encouraged to provide suggestions for enhancement of future editions of this manual.

Appendix A is the Supplemental Statement of Agency Policy on the Safety of Railroad Bridges, which contains non-regulatory items that are useful as information and guidance for track owners.

Appendix B contains the Schedule of Civil Penalties.

Appendix C contains the Defect Codes.

Text in italic font of this manual is regulatory language, whereas indented paragraphs provide field guidance for FRA inspectors. Indented paragraphs are not to be construed as regulatory language in any manner.

Subpart A – General

§ 237.1 Application

(a) Except as provided in paragraphs (b) or (c) of this section, this part applies to all owners of railroad track with a gage of two feet or more and which is supported by a bridge.

Guidance. This rule applies to all owners of track carried on railroad bridges with certain exceptions as outlined or explained in the following subsections.

As delineated in FRA's Statement of Agency Policy Concerning Enforcement of the Federal Railroad Safety Laws, FRA exercises jurisdiction over some tourist, scenic, and excursion railroad operations even if they are not conducted on the "general railroad system of transportation" (general system), which is defined as "the network of standard gage track over which goods may be transported throughout the nation." (49 CFR Part 209, Appendix A).

FRA notes that a "tourist railroad," including scenic or excursion railroads, comes under the uniform FRA definition of the term "railroad," as found at 49 CFR Section 209.3, and within the meaning of the Federal railroad safety statutes, as found at 49 U.S.C. 20102(1)(A). Tourist railroads move passengers by the use of track and equipment that, taken together, would commonly be described as a railroad, and their operations pose a distinct risk to the safety of the public. FRA typically does not exercise jurisdiction over operations on track gage that is less than 24 inches, and as a matter of policy, FRA does not consider devices that run on rails in amusement parks to be railroads.

With respect to the BSS, FRA is exercising jurisdiction over all tourist and excursion operations conducted over railroad bridges supporting track with a gage of 2 feet or more, regardless of whether they are conducted on the general system or whether they are insular. This part applies to both insular and non-insular tourist railroads because the passengers on those railroads are entitled to the protection afforded by this rule.

(b) This part does not apply to bridges on track used exclusively for rapid transit operations in an urban area that are not connected with the general railroad system of transportation.

Guidance. This is in accordance with 49 U.S.C. 20103 and 49 CFR Part 209, Appendix A.

FRA will exercise limited jurisdiction over an urban rapid transit operation only to the extent necessary to ensure railroad bridge safety on the portion of the urban rapid transit system where general railroad system of transportation operations occur. Consequently, if the general system portion of an urban rapid transit operation is over a railroad bridge, then Part 237 applies to that bridge.

(c) This part does not apply to bridges located within an installation which is not part of the general railroad system of transportation and over which trains are not operated by a railroad.

Guidance. "An installation which is not part of the general railroad system of transportation and over which trains are not operated by a railroad" refers to tracks located within an

industrial operation where rolling equipment is moved only by and for the account of that particular industry. If a railroad as defined in 49 CFR § 209.3 operates over a bridge inside such an installation, then this regulation applies to that bridge and to the owner of track on that bridge. A captive rail operation such as a mine to power plant rail line that is not part of the general system and not operated by a railroad but is run solely by the track owner's employees is not covered by Part 237.

Part 237 may apply to a bridge even if railroad employees do not operate a locomotive over that bridge. Merely moving rolling equipment over a bridge while under the control of railroad employees makes that bridge subject to these regulations. For example, in a coal unloading operation where the serving railroad shoves cars over a trestle leading to a rotary car dumper, at which point an indexing or mechanical car moving system takes over and moves the cars onto the car dumper, the approach trestle would be covered by this part, but the rotary car dumper would be exempt because the rolling stock was not being moved thereon by the railroad.

§ 237.3 Responsibility for compliance

(a) Except as provided in paragraph (b) of this section, an owner of track to which this part applies is responsible for compliance.

Guidance. The responsibility for the safety of trains on any track lies with the owner of that track. Therefore, the track owner is responsible for complying with the bridge safety standards promulgated in this part. The track owner may be a railroad, museum, public agency, or other private company. If a bridge carries tracks owned by two or more owners, then the track owners can choose to make an assignment of responsibility for compliance with this part.

Technically, this section requires all track owners to apply their respective bridge management programs (BMP) and required inspections to jointly owned properties. This is not an efficient use of resources; therefore, it is anticipated that one party will assume responsibility. In cases where responsibility for compliance is not in dispute, FRA will accept actions indicative of acceptance of responsibility as governing. However, joint owners should spell out responsibility for compliance through the filing of documentation with the appropriate FRA region. Where the parties dispute who is responsible for compliance with this part, FRA may hold all parties liable.

The assignment process, delineated in paragraphs (b) through (d) of this section, is similar to the assignment process detailed in 49 CFR § 213.5. However, FRA will hold the track owner or the assignee, or both, responsible for compliance with this part and subject to penalties under § 237.7. FRA intends that the responsibility for compliance with this part will follow, as closely as practicable, the responsibility for compliance with the Federal Track Safety Standards (TSS), and that where such responsibility is already established, it would not be necessary for the track owner to file an additional assignment of responsibility. FRA will consider any previously established assignment of responsibility for compliance with the TSS

to apply to compliance with the BSS until a properly filed assignment of responsibility under § 237.3(b) is made altering this linkage between the TSS and BSS.

This rule does not alter the financial responsibility of a highway agency that owns, inspects and maintains railroad bridges. The rule does, however, hold the track owner responsible to assure that the inspections and maintenance are performed correctly by qualified and designated persons. The track owner would be permitted to accept work performed by a highway agency provided that it conforms to the requirements of this part. Where track is owned by a State or other public agency, unless a compliant assignment of responsibility is on file for either Part 213 or Part 237, the State or other public agency as the track owner would be required to adopt a BMP, and comply with the terms of their BMP, as well as all other requirements of Part 237.

(b) If an owner of track to which this part applies assigns responsibility for the bridges that carry the track to another person (by lease or otherwise), written notification of the assignment shall be provided to the appropriate FRA Regional Office at least 30 days in advance of the assignment. The notification may be made by any party to that assignment, but shall be in writing and include the following—
(1) The name and address of the track owner;
(2) The name and address of the person to whom responsibility is assigned (assignee);
(3) A statement of the exact relationship between the track owner and the assignee;
(4) A precise identification of the track segment and the individual bridges in the assignment;
(5) A statement as to the competence and ability of the assignee to carry out the bridge safety duties of the track owner under this part; and
(6) A statement signed by the assignee acknowledging the assignment to him of responsibility for purposes of compliance with this part.

Guidance. Section 237.3(b) gives a track owner the responsibility to notify FRA in writing through the appropriate regional office, when the responsibility for compliance with this part is assigned. Notification must contain the specific information required in this paragraph and shall be made 30 days before the assignment of the responsibility becomes effective. In any case of assignment of responsibility, the assignee must first accept the assignment before it can become effective. The written notification of assignment must include a statement signed by the assignee acknowledging the assignment. A notification that does not include an acknowledging statement would not comply with § 237.3(b)(6), and FRA would disregard the assignment.

(c) The Administrator may hold the track owner or the assignee, or both, responsible for compliance with this part and subject to penalties under § 237.7.

Guidance. This paragraph concerns situations where the track is not owned by the operating railroad through an arrangement such as a lease agreement. Typically, when recommending civil penalties, the operating railroad will be cited. However, it may be appropriate to recommend civil penalties against the operating railroad **and** the track owner when both parties contributed to the deficiency. Inspectors must determine the responsible party when

recommending civil penalties for noncompliance and alert FRA's Office of Chief Counsel when violation reports involve parties other than the track owner.

This paragraph also provides that the party responsible for compliance can be other than the actual owner of the track through assignment of responsibility or if the Surface Transportation Board (formerly Interstate Commerce Commission) has issued a directed service order. FRA may hold responsible any party contracted by the track owner to ensure compliance with this part.

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

Guidance. On rare occasions, such as a cessation of service by a railroad, the Surface Transportation Board has directed a railroad other than the track owner to provide service. In such cases, the designated operator shall be considered as the owner for the purposes of compliance with the BSS.

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

Guidance. As in Part 213, FRA intends that "person" means an entity of any type covered under 1 U.S.C. 1, including but not limited to the following: a railroad; a manager, supervisor, official, or other employee or agent of a railroad; any owner, manufacturer, lessor, or lessee of railroad equipment, track, or facilities; any independent contractor providing goods or services to a railroad; any employee of such owner, manufacturer, lessor, lessee, or independent contractor; and anyone held by FRA to be responsible for compliance with this part.

This paragraph specifies that both employees of railroads and track owners, and contractors to railroads and track owners, are subject to the requirements of the BSS when they perform functions required by the BSS. This includes a State agency, which performs a function on a railroad bridge that is required by the BSS. Section 237.109 requires that the track owner keep the bridge inspection records, and must therefore obtain them from a State agency or any other party that performs bridge inspections in conformance with the requirements of these regulations.

(f) Where an owner of track to which this part applies has previously assigned responsibility for a segment of track to another person as prescribed in 49 CFR 213.5(c), additional notification to FRA is not required.

Guidance. FRA advises a track owner to resubmit a notification of assignment if the owner is uncertain whether an assignment has been made. Likewise, where it is not intended for responsibility for compliance with this part to be assigned to the same party assigned

responsibility for the segment of track upon which bridges are located, then a new assignment should be made. Assignment does not relieve a track owner of compliance with Part 237, as § 237.3(c) states that FRA can always hold the track owner responsible for compliance with the BSS.

(g) FRA reserves the right to reject an assignment of responsibility under § 237.5(b) for cause shown.

Guidance. As stated in paragraph (c) of this section, FRA may hold the track owner or the assignee, or both, responsible for compliance with this part and subject to penalties under § 237.7. But, if FRA rejects an assignment of responsibility, FRA will not consider the rejected assignee responsible for compliance with Part 237 pursuant to paragraph (c) of this section.

§ 237.5 Definitions

Guidance. The definitions in this section are only intended to apply to 49 CFR Part 237, and not to alter the same terminology wherever used outside this part for other purposes.

For the purposes of this part—

Bridge modification means a change to the configuration of a railroad bridge that affects the load capacity of the bridge.

Bridge repair means remediation of damage or deterioration which has affected the structural integrity of a railroad bridge.

Guidance. This part requires that modifications and repairs to bridges be designed by railroad bridge engineers, and the work be supervised by designated railroad bridge supervisors. These definitions clarify that minor modifications and repairs, such as replacing a wire rope handrail with one made of pipe or painting a bridge, do not need to be designed and supervised pursuant to this part. However, this does not exempt the track owner from properly supervising the personal safety of the individuals performing the work because that issue is addressed in other rules.

Replacement of structural components in-kind often extends beyond the scope of minor modification or repair, and therefore design by a railroad bridge engineer is warranted. For instance, while it may be common practice to replace failed timber stringers with similarly sized timber, improper execution can result in reduced bridge load capacity. In such cases, input from a qualified and designated railroad bridge engineer is required, as is the supervision of such work by a designated railroad bridge supervisor.

Railroad bridge means any structure with a deck, regardless of length, which supports one or more railroad tracks, or any other undergrade structure with an individual span length of 10 feet or more located at such a depth that it is affected by live loads.

Guidance. A "railroad bridge" is any structure that spans an opening under the track except for a small culvert, pipe, or other such structure where that structure is located so far below the track that it only carries dead load from soil pressure and is not subjected to measurable bending, tension, or compression stresses from passing trains. Unloading pits, car dumpers, track scales, turntables, transfer tables, and waterfront structures such as piers and wharves that fall within the definition of a railroad bridge are considered bridges for purposes of the BSS.

Additionally, culverts with a span of 10 feet or more located at such a depth that they are affected by live loads are subject to this regulation and must be included in the track owner's BMP. The determination of whether such a structure is affected by live loads is the responsibility of the railroad bridge engineer, through the use of appropriate engineering methods and judgment.

A bridge deck includes open decks, ballasted decks, and solid decks. Essentially, a bridge deck is the component of the bridge on which the track is supported, and which is subject to bending stresses from trains moving over it.

Retaining walls and other roadbed structures are not included, because they do not carry track on a span over a gap. FRA does not intend to relieve a railroad from taking any action necessary to protect the safety of trains in the case of any structure, including small culverts, retaining walls, tunnels, or overhead structures by providing for their inspection and maintenance, but it exempts them from the specific requirements of the BSS. A structure in a locomotive or car maintenance facility that is used to support cars or locomotives for maintenance is not included in the specific requirements of this regulation.

Track owner means a person responsible for compliance in accordance with § 237.3.

§ 237.7 Penalties

(a) Any person who violates any requirement of this part or causes the violation of any such requirement is subject to a civil penalty of at least $650 and not more than $25,000 per violation, except that: Penalties may be assessed against individuals only for willful violations, and, where a grossly negligent violation or a pattern of repeated violations has created an imminent hazard of death or injury to persons, or has caused death or injury, a penalty not to exceed $105,000 per violation may be assessed. "Person" means an entity of any type covered under 1 U.S.C. 1, including but not limited to the following: A railroad; a manager, supervisor, official, or other employee or agent of a railroad; any owner, manufacturer, lessor, or lessee of railroad equipment, track, or facilities; any independent contractor providing goods or services to a railroad; any employee of such owner, manufacturer, lessor, lessee, or independent contractor; and anyone held by the Administrator of the Federal Railroad Administration to be responsible under § 237.3(d). Each day a violation continues shall constitute a separate offense. See Appendix B to this part for a statement of agency civil penalty policy.

Guidance. This provision conforms to provisions of the enabling legislation and agency policy. Consistent with FRA's Statement of Agency Policy Concerning Enforcement of the

Federal Railroad Safety Laws, a penalty may be assessed against an individual only for a willful violation. The Administrator reserves the right to assess a penalty of up to $105,000 for any violation where circumstances warrant. (See 49 CFR Part 209, Appendix A.) This section covers all subparts of Part 237.

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

§ 237.9 Waivers

(a) Any person subject to a requirement of this part may petition the Administrator for a waiver of compliance with such requirement. The filing of such a petition does not affect that person's responsibility for compliance with that requirement while the petition is being considered.

Guidance. FRA inspectors have no authority under the BSS to grant waivers.

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

Guidance. Any petition for a waiver must be filed by the track owner or designated operator with the Docket Clerk, Office of Chief Counsel, in Washington, DC. Refer to the FRA General Manual for complete information regarding waiver procedures. Title 49 CFR Part 211 prescribes rules of practice that apply to waiver proceedings. The processing of petitions for the waiver of safety rules is found at 49 CFR Part 211, Subpart C.

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

Guidance. FRA inspectors must be notified of any waivers in effect in their assigned territory.

Subpart B – Railroad Bridge Safety Assurance

Guidance. This subpart prescribes minimum requirements for persons responsible for railroad bridges to implement programs to assure the structural integrity of those bridges and to protect the safe operation of trains over those bridges. The responsibility for the safety of a railroad bridge rests with the owner of the track supported by that bridge, who in turn relies upon the work of the railroad bridge engineer who makes the critical decisions regarding the management and use of that bridge.

§ 237.31 Adoption of bridge management programs

Each track owner shall adopt a bridge safety management program to prevent the deterioration of railroad bridges by preserving their capability to safely carry the traffic to be operated over them, and reduce the risk of human casualties, environmental damage, and disruption to the Nation's railroad transportation system that would result from a catastrophic bridge failure, not later than the dates in the following schedule:

(a) March 14, 2011: Class I carriers;
(b) March 14, 2011: Owners of track segments which are part of the general railroad system of transportation and which carry more than ten scheduled passenger trains per week;

Guidance. For a track segment to be considered part of the general railroad system of transportation, it must be of standard (4 feet 8½ inches) gage.

(c) September 13, 2011: Class II carriers to which paragraph (b) of this section does not apply; and
(d) September 13, 2012: All other track owners subject to this part and not described [in] paragraphs (a) through (c) of this section.

Guidance. Any track owner subject to this part commencing operations on or after September 13, 2012, must adopt their BMP by the date that rail operations begin.

§ 237.33 Content of bridge management programs

Guidance. Certain primary elements of a BMP are enumerated in this section. Track owners and individuals responsible for the safety of railroad bridges are encouraged to adapt these elements to the needs of their areas of responsibility, and to adopt additional elements not inconsistent with the requirements of this part.

In cases where the requirements specified in a track owner's BMP exceed the minimum regulatory requirements, FRA cannot cite either a defect or a violation against the company for failure to comply with its own BMP to the extent that the company's requirements exceed those of the regulations. In such a case, the FRA inspector should write a comment to the company detailing such deficiencies. If, however, the company fails to meet the minimum regulatory requirements, then either a defect or violation is appropriate.

Not all items required to be included in a track owner's BMP are listed in this section. Additional provisions required to be included in the BMP include scheduling of inspections (§ 237.101(a)), requirements for special inspection following a potentially compromising event (§ 237.101(c)), inspection procedures (§ 237.103(a)), prescription of procedures to protect operations following a potentially compromising event (§ 237.105(a)), underwater or scour inspection (§ 237.105(b)), minimum content of bridge inspection reports (§ 237.109(c)), record retention location (§ 237.109(d) and (e)), and internal audit provisions (§ 237.153(a)).

Each bridge management program adopted in compliance with this part shall include, as a minimum, the following:

(a) An accurate inventory of railroad bridges, which shall include a unique identifier for each bridge, its location, configuration, type of construction, number of spans, span lengths, and all other information necessary to provide for the management of bridge safety;

Guidance. Congress mandated that the new regulations require each track owner to "develop and maintain an accurate inventory of its railroad bridges, which shall identify the location of each bridge, its configuration, type of construction, number of spans, span lengths, and all other information necessary to provide for the safe management of the bridges" (RSIA Section 417(b)(1)). This paragraph requires that such an inventory be maintained. An accurate inventory of any property to be managed is essential so that the responsible individuals may schedule and monitor inspection, maintenance, and repair of the property units.

With regard to location, Appendix A provides non-regulatory guidance in Guideline 14(b)(2), suggesting that track owners provide "[t]he location of the bridge by nearest town or station, and geographic coordinates." FRA prefers that the town/city/political subdivision and State be provided. Giving the location by railroad subdivision and milepost is permissible because that information is sufficient to locate the bridge in the field.

Including the "feature crossed" in the inventory is encouraged but is not strictly required unless FRA deems it so under the blanket of "all other information necessary to provide for the management of bridge safety." For bridges over streets or navigable waterways used by commercial maritime vessels, inclusion of the name of the feature crossed is necessary to provide for the management of bridge safety in the event of a vehicle or vessel collision.

Geographic (GPS) coordinates are not required but are encouraged, as they are useful in locating the correct bridge, especially following an adverse event such as a derailment or bridge strike.

The bridge inventory need not be complete in all of its details at the time of BMP adoption. It is reasonable to expect that an adopted program would specify the format for recording the inventory information, or "bridge list," and that information be readily available from existing records, such as valuation maps, that could be used to initially populate the database. After that, additions and refinements to that information would be generated by normal inspection work.

The bridge inventory may be included as an appendix to the BMP or referenced as a separate, stand-alone document. In such a case, it is desirable for the actual BMP to contain a sample inventory page or otherwise define the format and content required in the full inventory.

(b) A record of the safe load capacity of each bridge;

Guidance. Congress mandated that the new regulations require that the track owner "maintain, and update as appropriate, a record of the safe capacity of each bridge which carries its track and, if available, maintain the original design documents of each bridge and a documentation of all repairs, modifications, and inspections of the bridge." (RSIA Section 417(b)(3)). This paragraph thereby requires that a record of the safe load capacity of each bridge be established. The safe load capacity would typically be the Normal Rating. The operation of excessively heavy loads over a bridge will considerably shorten a bridge's useful life and will reduce or even eliminate the margin of safety between structural integrity and catastrophic failure. It is essential that the track owner know that the loads permitted to be operated on a bridge are within the safe limits of the bridge.

(c) A provision to obtain and maintain the design documents of each bridge if available, and to document all repairs, modifications, and inspections of each bridge; and

Guidance. The track owner must obtain and maintain the design documents of each bridge, if available, and document all repairs, modifications, and inspections of each bridge. The determination of safe load capacity requires knowledge of the configuration of the bridge and the materials of which it is constructed. Although the configuration may be determined by actual measurements of all of the components, that procedure can be tedious and expensive. Good documentation of the design and history of a bridge will facilitate more rapid and accurate determination of bridge capacity when such calculations are needed, as well as determination of the maintenance and service history of a bridge to detect and correct possible deterioration of its components. If the design documents for a bridge cannot be located, the track owner must measure and document the configuration of the bridge in sufficient detail to enable an accurate determination of the safe capacity of the bridge.

Pursuant to § 237.33(c), the program adopted by a track owner need only incorporate a provision to obtain and maintain the design documents of each bridge if available, and to document all repairs, modifications, and inspections of each bridge. There is no deadline for acquisition of these documents. FRA anticipates that the priorities for acquisition of archived bridge design documents would closely follow their usefulness in determining bridge capacities.

Records of individual designations as required by § 237.57, especially with regard to railroad bridge engineers designing repairs or modifications should be treated as permanent bridge records and retained with the rest of the design documents.

(d) A bridge inspection program covering as a minimum:
(1) Inspection personnel safety considerations;
(2) Types of inspection including required detail;

(3) Definitions of defect levels along with associated condition codes if condition codes are used;
(4) The method of documenting inspections including standard forms or formats;
(5) Structure type and component nomenclature; and
(6) Numbering or identification protocol for substructure units, spans, and individual components.

Guidance. Bridge inspection is absolutely essential to an effective BMP. In this paragraph, FRA requires that the track owner's BMP contain a bridge inspection program. Items (1) through (6) should be addressed in the program to a degree that promotes effective and efficient conduct of the inspection program.

With regard to Item (1), bridge inspection can present certain risks that are inherent in working at heights and around moving vehicles. A bridge inspection program should at least address the unique hazards associated with the inspection process. The track owner's program may either directly cover the safety issues unique to bridge inspection or make reference to existing safety policies and procedures that cover the same topics. The safety aspects that FRA expects to see covered include Roadway Worker Protection; bridge worker safety and fall protection; use of ladders; working around highway traffic; traversing hazardous, sloping, or slippery ground or surfaces; and environmental issues such as poisonous vegetation, dangerous reptiles, stinging insects, and other hazardous wildlife likely to be encountered.

With regard to Item (2), a bridge inspection program should incorporate standards for the procedures and required details of any different types of inspection that are referenced in the program, such as annual inspections, post-event inspections, rating inspections, and intermediate periodic inspections. A large railroad might find it convenient to describe the standard procedures for various types of inspections in some detail, while a small railroad that normally conducts only annual inspections might describe only that procedure as well as post-event special inspections, and then issue instructions of particular applicability for other types of inspections that occur only infrequently.

With regard to Items (3) through (6), use of a standard method of describing the condition of components promotes effective and efficient communication between the inspector and those persons who review and evaluate a bridge using information from the inspection.

The "definition of defect levels" referred to in Item (3) requires a bridge inspection program using adjective descriptors (good, fair, poor, serious, critical, etc.) to describe in a quantitative manner the level of deterioration of a component or structural system that is associated with each descriptor. For example, if not defined, one inspector might classify 10 percent steel reduction in a critical area as fair, while another might classify the defect as critical. This can lead to wide variations between inspectors when assigning condition codes to identical conditions. The ultimate goal is for the content of an inspection report to convey to the railroad bridge engineer sufficient information for the engineer to make an informed decision as to the criticality of a deficiency. It is acceptable for a bridge inspection program to not define defect levels only when the program requires narrative descriptions of deficiencies.

Such narrative descriptions must be quantitative providing information such as percentage of section loss, widths and lengths of cracks, dimensions of spalls, etc. in order to provide the reviewing engineer sufficient detail to accurately interpret the conditions present at the bridge.

Various railroads use condition codes, priority codes, or a combination of the two. Typically, the difference between these two systems is that adjective-based condition codes describe to the railroad bridge engineer the extent or seriousness of a deficiency, while priority codes provide the railroad bridge inspector's opinion of how soon a deficiency must be remediated.

Subpart C – Qualifications and Designations of Responsible Persons

Guidance. This subpart establishes minimum standards for the qualifications and designations of persons who perform safety-critical functions that affect the integrity and safety of railroad bridges. Many aspects of railroad bridge work differ from other fields of engineering, inspection, and maintenance. It is essential that the individuals who are responsible for these safety-critical functions be qualified by education, training, and experience to perform them correctly.

§ 237.51 Railroad bridge engineers

(a) A railroad bridge engineer shall be a person who is determined by the track owner to be competent to perform the following functions as they apply to the particular engineering work to be performed:
(1) Determine the forces and stresses in railroad bridges and bridge components;
(2) Prescribe safe loading conditions for railroad bridges;
(3) Prescribe inspection and maintenance procedures for railroad bridges; and
(4) Design repairs and modifications to railroad bridges.

Guidance. This section sets forth the minimum standards that a railroad bridge engineer (RBE) must meet. Congress directed FRA to "ensure that an engineer who is competent in the field of railroad bridge engineering – (A) is responsible for the development of all inspection procedures; (B) reviews all inspection reports; and (C) determines whether bridges are being inspected according to the applicable procedures and frequency, and reviews any items noted by an inspector as exceptions" (RSIA Section 417(b)(7)). Railroad bridge engineering is based on the same principles of engineering as all other structural engineering work, but the application of many of those principles is unique to this particular field. The live loads carried on railroad bridges are generally much higher than the loads on highway bridges or other transportation structures. Overall configuration and details of construction of railroad bridges differ greatly from other classes of structures, to the extent that dealing with these features requires some experience with them as well as an understanding of the fundamentals of engineering.

FRA understands that not all RBEs will be faced with all aspects of railroad bridge engineering. For example, an engineer engaged to prescribe safe loads for short steel spans and timber trestles on a particular railroad might never have to perform a detailed analysis of a large truss bridge. The basic premise is that the engineer must be competent to perform the functions that are encompassed by that individual's employment. The determination of qualifications by the track owner includes employment of the engineer by the track owner, and designation of the engineer to exercise the authority called for in this part. An RBE need not be an actual employee of the track owner but could be a consultant or independent contractor engaged to provide this service.

The determination of the competence of an RBE is the responsibility of the track owner. FRA does not intend to engage in qualifying individuals to perform those functions. That

determination will have to be made by the track owner after reviewing the engineer's qualifications and experience in the light of the qualification requirements of this part. The engineer's employer or the engineer's client has always had the prerogative and responsibility to determine the qualifications of that individual, and FRA does not intend to alter that relationship.

(b) The educational qualifications of a railroad bridge engineer shall include either:
(1) A degree in engineering granted by a school of engineering with at least one program accredited by ABET, Inc. or its successor organization as a professional engineering curriculum, or a degree from a program accredited as a professional engineering curriculum by a foreign organization recognized by ABET, Inc. or its successor; or
(2) Current registration as a professional engineer.

Guidance. FRA did not intend to exclude engineers who received their education in other Nations from being recognized as RBEs. In order to fulfill the educational requirements of this section, an RBE can also have received a degree from a program accredited as a professional engineering curriculum by a foreign organization recognized by ABET, Inc., or its successor. An RBE can also be considered to have fulfilled the educational requirements of this section if he or she is currently registered as a professional engineer. FRA notes that State law governing the professional practice of engineering requires that professional engineers limit the subject of their practice to areas in which they are competent.

FRA believes that the critical nature of railroad bridge engineering work called for in this rule requires persons to meet a minimal educational or experience standard that is common to the engineering profession and that is necessary for an individual who will perform the functions of an engineer as called for in this rule.

(c) Nothing in this part affects the States' authority to regulate the professional practice of engineering.

Guidance. Recognition by FRA as an RBE would not enable a person to provide professional engineering services in violation of a State law or regulation. FRA does not intend to preempt or interfere with any State laws regarding the professional practice of engineering. For example, a person registered as a professional engineer in Maryland could not work as a professional engineer in Virginia under this regulation if such work violated Virginia law regarding the practice of engineering.

§ 237.53 Railroad bridge inspectors

A railroad bridge inspector shall be a person who is determined by the track owner to be technically competent to view, measure, report and record the condition of a railroad bridge and its individual components which that person is designated to inspect. An inspector shall be designated to authorize or restrict the operation of railroad traffic over a bridge according to its immediate condition or state of repair.

Guidance. This section represents minimum standards that a railroad bridge inspector (RBI) must meet. Effective inspection of bridges is essential to preserving their integrity and serviceability. RBIs must be able to understand and carry out the inspection procedures, including accessing inspection points on a bridge, measuring components and any changes, describing conditions found in a standard, unambiguous manner, and detecting the development of conditions that are critical to the safety of the bridge. It is essential that an RBI who detects a potential hazard to the safe operation of trains be authorized by the track owner to place appropriate restrictions on the operation of railroad traffic, pending review as necessary by an RBE. An individual who is not competent in railroad bridge work cannot overrule a determination made by a designated RBI, RBE, or railroad bridge supervisor (RBS).

§ 237.55 Railroad bridge supervisors

A railroad bridge supervisor shall be a person, regardless of position title, who is determined by the track owner to be technically competent to supervise the construction, modification or repair of a railroad bridge in conformance with common or particular specifications, plans and instructions applicable to the work to be performed, and to authorize or restrict the operation of railroad traffic over a bridge according to its immediate condition or state of repair.

Guidance. This section represents minimum standards that an RBS must meet. Individuals who supervise and take responsibility for construction, repair, and modification of railroad bridges must be competent to ensure that the work is performed in accordance with valid standards and any particular specifications, plans, and instructions applicable to the work to be performed. An RBS must be authorized by the track owner to approve or restrict the movement of railroad traffic over a bridge according to its current condition or state of repair. This provision applies to any such individual, regardless of job title, who directly oversees such work and approves or restricts the movement of railroad traffic during the progress of the work.

§ 237.57 Designation of individuals

Each track owner shall designate those individuals qualified as railroad bridge engineers, railroad bridge inspectors and railroad bridge supervisors. Each individual designation shall include the basis for the designation in effect and shall be recorded.

Guidance. In the RSIA, Congress mandated that the bridge regulations designate qualified bridge inspectors or maintenance personnel to authorize the operation of trains on bridges following repairs, damage, or indications of potential structural problems (RSIA Section 417(b)(8)). In this section, FRA requires that each track owner designate certain individuals as qualified RBEs, RBIs, or RBSs, and provide a recorded basis for each designation in effect. The track owner must record designations of individuals, whether employees, consultants, or contractors. If a consultant or contractor has several individuals performing the described functions, then one or more individuals should be designated as being responsible to the track owner for the work performed under that engagement, with the others working under the responsible charge of that individual.

Designation must be made by name, not by craft or position title. Although the non-regulatory language contained in Appendix A, Guideline Paragraph 14(a), states that "[t]he designations may be made by position or by individual," FRA requires that proper names be used in the records of designations, as stated in regulatory text.

Where design plans and specifications are prepared by a consultant RBE, it is permissible for the track owner's BMP to specify that the record of designation is the signature and seal of the responsible professional engineer affixed to the design documents, and the basis for the designation is licensure as a professional engineer.

Records of designations must be retained for as long as they are needed to demonstrate compliance with this section. In the case of bridge inspection records, this would be for as long as the inspection record exists. The record of designation for the RBI that conducted the inspection must be maintained for as long as the report remains in the track owners' records. Additionally, the records of designation for the RBS and/or RBE that reviewed the report must be maintained for a similar period. For example, if the track owner chooses to purge bridge inspection records after the minimum 2-year retention, the records of designation pertaining thereto may also be destroyed. However, it the track owner decides to keep the inspection reports for 10 years, the designation records must also be retained for 10 years.

For engineering designs completed relative to construction, repair, or modification, where the actual work is performed on or after September 13, 2010, the required designation record retention period would be for the life of the bridge.

For bridge work such as construction, repairs, or modifications that is required to be designed by an RBE per § 237.131, the designation records should be treated like a permanent bridge record and retained until the bridge no longer exists, as required by § 237.33(c). The record of designation documentation could be kept in the bridge file or retained in some other manner. While not required, it is good practice for the track owner's BMP to specify the location and manner in which designation records are filed.

Subpart D – Capacity of Bridges

Guidance. This subpart prescribes minimum standards to be incorporated in railroad BMPs to prevent the operation of equipment that could damage a bridge by exceeding safe stress levels in bridge components or by extending beyond the horizontal or vertical clearance limits of the bridge. Protection of bridges and bridge components from overstress is essential to the continued integrity and serviceability of the bridge. It is also essential that equipment or loads that exceed the clearance limits of a bridge not be operated due to the potential for severe damage to the bridge.

§ 237.71 Determination of bridge load capacities

(a) Each track owner shall determine the load capacity of each of its railroad bridges. The load capacity need not be the ultimate or maximum load capacity, but must be a safe load capacity.

Guidance. Each track owner must determine the load capacity of each of its railroad bridges. The safe load capacity would typically be the Normal Rating and include an evaluation of the substructure as well as the superstructure. It is essential that the track owner know that loads operated over a bridge do not exceed the safe capacity of that bridge. However, once it is determined that a bridge has adequate capacity to carry the loads being operated, the regulation does not require that the track owner precisely calculate the additional capacity of that bridge, although that could be useful from a planning or economic standpoint.

(b) The load capacity of each bridge shall be documented in the track owner's bridge management program, together with the method by which the capacity was determined.

Guidance. This paragraph requires that the load capacity of each bridge be documented in the track owner's BMP, together with the method by which the capacity was determined. Once the load capacity is determined, the value must be recorded in order for it to be useful. Examples of methods of determination could be the original design documents, recalculation, or rating inspection.

(c) The determination of load capacity shall be made by a railroad bridge engineer using appropriate engineering methods and standards that are particularly applicable to railroad bridges.

Guidance. In the RSIA, Congress mandated that a professional engineer competent in the field of railroad bridge engineering, or a qualified person under the supervision of the track owner, determine bridge capacity (RSIA Section 417(b)(2)). Load capacity determination in most instances requires the education, experience, and training of an engineer who is familiar with railroad bridges and the standard practices that are unique to that class of structure.

The present standard references for railroad bridge design and analysis are found in the American Railway Engineering and Maintenance-of-Way Association's (AREMA) Manual for Railway Engineering. The chapters in the manual dealing with timber, concrete and steel

structures, and seismic design, are under continuous review by committees consisting of leading engineers in the railroad bridge profession, including FRA representatives. Although bridges exist that were designed using different or earlier references, they can still be evaluated by use of the AREMA Manual.

There is a clear distinction between what some consider a "condition rating" ascribed to a bridge by an RBI, and a "capacity rating," which is determined by a qualified railroad bridge engineer. The term "rating" in the context of this rule refers only to a capacity rating. This rule does not address a condition rating to be applied to a bridge.

(d) Bridge load capacity may be determined from existing design and modification records of a bridge, provided that the bridge substantially conforms to its recorded configuration. Otherwise, the load capacity of a bridge shall be determined by measurement and calculation of the properties of its individual components, or other methods as determined by a railroad bridge engineer.

Guidance. This paragraph permits bridge load capacity to be determined from existing design and modification records of a bridge, provided that the bridge substantially conforms to its records configuration. Where deterioration or section loss exists, the effects of such must be taken into account. Determination of bridge load capacity requires information on the configuration of the bridge and the dimensions and material of its component parts. If the bridge is found to conform to the drawings of its original design and modifications, those drawings may serve as the basis for any rating calculation that might be performed; thereby, simplifying the process. Lacking that prior information, it is necessary; that the configuration, dimensions, condition, and properties of the bridge and its components be determined by on-site measurement of the bridge as it currently exists.

A rigorous, exact method of rating is not practicable with several types of bridges, including some massive concrete or masonry structures and many timber trestles. The RBE will necessarily use judgment in determining the loads that should be permitted to operate over these bridges, and assure that adequate inspections are performed so that any developing deterioration or signs of overload are detected before they progress to become a serious problem.

FRA recognizes that the evaluation of timber trestles is not an exact science. Although theoretical values of safe forces and stresses can be placed on individual timber components, the actual nature of wood varies widely, even within the same species. FRA also recognizes that many older concrete and masonry structures are not documented. Especially in the case of reinforced concrete, the configuration of reinforcing steel greatly affects the calculated capacity of the bridge. The analysis of brick and stone arches is possible, but the unknown variables can produce widely differing results. In the railroad bridge engineering profession, the practice has been to observe these structures for any obvious signs of distress and to rate them based on their condition at the time of inspection. FRA will accept the reasonable application of present methods for evaluating and managing these structures.

The terms "normal rating" and "maximum rating" found in the AREMA Manual for Railway Engineering are often used when describing bridge ratings. There may be instances where the calculated Normal Rating for a concrete structure is not adequate for the equipment that is being operated, and has been operated for decades without incident or signs of structural distress. In such a case, it is up to the RBE to determine the safe load capacity of the bridge. Assuming that the rating requirements found in the AREMA Manual are being followed, the RBE is permitted to determine a safe load capacity greater than a Normal Rating so long as it is understood that operating loads producing stresses greater than a Normal Rating will likely shorten the useful life of the bridge. If the loads being permitted produce stresses greater than the calculated Maximum Rating for the bridge, the RBE will be hard-pressed to justify the safe load capacity determination. It may be necessary to take core samples to demonstrate that the strength of the concrete is greater than the design strength and then recalculate the AREMA ratings using revised material strengths. Alternatively, the RBE might choose to exercise engineering judgment, as permitted by § 237.71(d), where it states "[o]therwise, the load capacity of a bridge shall be determined by measurement and calculation of the properties of its individual components, **or other methods as determined by a railroad bridge engineer**" (emphasis added). This language was included in the regulations to permit an RBE to rate a bridge by "observation" recognizing the fact that many masonry or concrete structures lack as-built drawings that actually reflect the as-built configuration.

A bridge inspector or supervisor who is not an engineer can certainly determine by observation and measurement whether the condition and configuration of a bridge corresponds with its state when it was rated by an engineer for capacity. However, if the bridge displays a condition or deterioration that materially affects its capacity, as by increasing the stress intensity in one or more components of the bridge, accurate determination of the revised capacity requires the experience, education, and training of a competent RBE. In the same manner, the determination of the capacity of an existing bridge requires that the engineer should consider all available information related to the configuration and condition of the bridge, including all available design and modification documents and current reports of inspections.

(e) If a track owner has a group of bridges for which the load capacity has not already been determined, the owner shall schedule the evaluation of those bridges according to their relative priority, as established by a railroad bridge engineer. The initial determination of load capacity shall be completed not later than five years following the required date for adoption of the track owner's bridge management program in conformance with § 237.31.

Guidance. In this paragraph, FRA requires a track owner to schedule the evaluation of bridges for which the load capacity has not already been determined. This section provides for a phase-in period for determination of bridge capacities in order to allow a reasonable time period for track owners to accomplish this work. It is intended that the unrated bridges be given relative priority for rating, based on the judgment of an RBE. This prioritization can be accomplished either by observation or by evaluation of certain critical members of a bridge, as determined by the engineer using professional judgment.

The deadlines for the initial determination of load capacity are as follows:

- March 14, 2016: Class I carriers
- March 14, 2016: Owners of track segments that are part of the general railroad system of transportation and that carry more than 10 scheduled passenger trains per week.

  Where a passenger carrier (intercity, commuter, museum, tourist, etc.) is not in operation or has not reached the threshold of more than 10 scheduled passenger trains per week between September 13, 2010, and March 14, 2011, calculation of the 5-year load capacity determination period begins on the date that the threshold is reached, but in no case later than September 13, 2012. For these track owners, the 5 years in which to determine bridge load capacities begins on the delayed date of BMP adoption. All track owners covered by Part 237 must have bridge load capacity determinations completed by September 13, 2017, at the absolute latest. For example, the ABC Scenic Railway (ABCR) does not operate during the winter months. ABCR begins operating two trains per day on Saturday and Sunday for the month of April and most of May. ABCR increases its tourist season operations on Memorial Day weekend by running three trains on Friday, May 27, 2011, and then four trains each day on Saturday, Sunday, and Monday (Memorial Day). Since it will run its 11th scheduled passenger train on Sunday, May 29, 2011, adoption of its BMP is required no later than May 29, 2011. Determination of bridge load capacities would then be required by May 29, 2016, at the latest.

- September 13, 2016: Class II carriers to which § 237.31(b) does not apply.

- September 13, 2017: All other track owners subject to this part and not described in paragraphs (a) through (c) of § 237.31.

For track owners to which Part 237 becomes applicable on or after September 13, 2017, a complete BMP, including determination of all bridge load capacities, must be adopted by the time railroad operations commence. There will be no 5-year period following the date of BMP adoption during which to rate their bridges.

(f) Where a bridge inspection reveals that, in the determination of the railroad bridge engineer, the condition of a bridge or a bridge component might adversely affect the ability of the bridge to carry the traffic being operated, a new capacity shall be determined.

Guidance. A new capacity must be determined by an RBE when a bridge inspection record reveals that the condition of a bridge or a bridge component might adversely affect the load capacity of the bridge. Accurate determination of current bridge capacity depends on accurate information about the current configuration and condition of the bridge. It is the responsibility of the RBE to determine if a change in condition or configuration calls for a revised rating calculation.

(g) Bridge load capacity may be expressed in terms of numerical values related to a standard system of bridge loads, but shall in any case be stated in terms of weight and length of individual or combined cars and locomotives, for the use of transportation personnel.

Guidance. Engineers use standard definitions of loading combinations for design and rating of bridges. Common among these standard definitions is a series of proportional loads known as the Cooper System. The capacity of a bridge and its components can be described in terms of a Cooper Rating, and the effect of rail equipment on a bridge can also be related to a Cooper System value.

Proper application of this system requires a full understanding of its use and limitations. However, the results of its application can be translated into terms of equipment weights and configurations that can be effectively applied by persons who manage regular transportation operations of the railroad. This enables them to determine if a given locomotive, car, or combination can be operated on a bridge with no further consideration, or if the equipment must be evaluated by an RBE as an exceptional movement.

(h) Bridge load capacity may be expressed in terms of both normal and maximum load conditions. Operation of equipment that produces forces greater than the normal capacity shall be subject to any restrictions or conditions that may be prescribed by a railroad bridge engineer.

Guidance. Normal bridge ratings generally define the loads that can be operated on a bridge for an indefinite period without damaging the bridge. In some cases (mostly involving steel or iron bridges) a higher rating, up to a maximum rating, can be given to the bridge to permit the operation of heavier loads on an infrequent basis. These heavier loads should not, in themselves, damage the bridge, but the cumulative effect of the higher resulting stresses in bridge members could cause their eventual deterioration and reduce their useful life.

Operation of equipment that produces forces greater than the normal capacity shall be subject to any restrictions or conditions that may be prescribed by an RBE. An RBE can often prescribe compensating conditions that will permit the movement of equipment that is heavier than normal. Examples include speed restrictions to reduce the impact factor of the rolling load, the insertion of lighter-weight spacer cars between the heavier cars in a train, restricting operations to only one track at a time, or the installation of temporary bents or other supports under specific points on the bridge.

§ 237.73 Protection of bridges from over-weight and over-dimension loads

(a) Each track owner shall issue instructions to the personnel who are responsible for the configuration and operation of trains over its bridges to prevent the operation of cars, locomotives and other equipment that would exceed the capacity or dimensions of its bridges.

Guidance. Bridges can be seriously damaged by the operation of loads that exceed their capacity. Movement of equipment that exceeds the clear space on a bridge is an obvious safety hazard. In this section, FRA addresses Congress' mandate in the RSIA that the track

owner "develop, maintain, and enforce a written procedure that will ensure that its bridges are not loaded beyond their capacities" (RSIA Section 417(b)(4)).

Transportation personnel of a railroad are ultimately responsible for the movement of trains, cars and locomotives. It is essential that they should know and follow any restrictions that are placed on those movements. Until such time as the initial determination of load capacity has been made in accordance with § 237.71, FRA expects the track owner to have some reasonable basis for the weight limits being permitted on its bridges. Old timetables or other legacy documents should be researched in order to establish this reasonable basis for use in issuing weight instructions during that period prior to the RBE determining a safe load capacity through calculation or other acceptable methods.

(b) The instructions regarding weight shall be expressed in terms of maximum equipment weights, and either minimum equipment lengths or axle spacing.

Guidance. Transportation personnel have information on the weights and configuration of cars and locomotives, and they must be able to relate that information to any restrictions placed on the movement of that equipment. Prior to the promulgation of the BSS, many railroads issued instructions regarding weight in terms of maximum car weight only. This paragraph requires that in addition to the maximum weight, the instructions must include either the minimum equipment lengths or the minimum axle spacing. This requirement applies to locomotives as well as railroad cars.

(c) The instructions regarding dimensions shall be expressed in terms of feet and inches of cross section and equipment length, in conformance with common railroad industry practice for reporting dimensions of exceptional equipment in interchange in which height above top-of-rail is shown for each cross section measurement, followed by the width of the car of the shipment at that height.

Guidance. In the industry, a standard format exists for the exchange of information on dimensions of railroad equipment. Use of the industry practice is necessary to avoid error and confusion. It is permissible to issue dimension instructions using the Association of American Railroads Clearance Plates, as these define the limiting dimensions for a given plate.

(d) The instructions may apply to individual structures, or to a defined line segment or group(s) of line segments where the published capacities and dimensions are within the limits of all structures on the subject line segments.

Guidance. Railroads commonly issue instructions related to equipment weights and dimensions to be effective on line segments of various lengths. It is not necessary that transportation personnel be advised of the capacity of every bridge as long as each bridge in the line segment has the capacity to safely carry the loads permitted on that line.

Subpart E – Bridge Inspection

Guidance. This subpart establishes minimum standards to be incorporated into railroad BMPs to provide for an effective program of bridge inspections.

Bridge inspection is a vital component in any BMP. A bridge with undetected or unreported damage or deterioration can present a serious hazard to the safe operation of trains. Bridge inspection and evaluation is a multitiered process, unlike many other types of inspection on a railroad. While track, equipment, and signal inspectors usually can compare measurements against common standards to determine whether the inspected feature complies with the standards, such is not the case with most bridges. The evaluation of a bridge requires the application of engineering principles by a competent person, who is usually not present during the inspection. It is therefore necessary that an inspection report show any conditions on the bridge that might lead to a reduction in capacity, initiation of repair work, or a more detailed inspection to further characterize the condition.

§ 237.101 Scheduling of bridge inspections

(a) Each bridge management program shall include a provision for scheduling an inspection for each bridge in railroad service at least once in each calendar year, with not more than 540 days between any successive inspections.

Guidance. In this paragraph, FRA establishes regulations to address Congress' mandate that the track owner "conduct regular comprehensive inspections of each bridge, at least once every year, and maintain records of those inspections that include the date on which the inspection was performed, the precise identification of the bridge inspected, the items inspected, an accurate description of the condition of those items, and a narrative of any inspection item that is found by the inspector to be a potential problem" (RSIA Section 417(b)(5)). Annual inspection of bridges has been an industry practice for more than a century, and has proven to be an effective tool of bridge management. Even where a bridge sees very low levels of railroad traffic, the potential still exists for damage from external sources or natural deterioration. This paragraph calls for one inspection per calendar year, with no more than 540 calendar days between the dates of completion of successive inspections. For example, if a bridge is inspected on January 3, 2011, it becomes overdue for inspection on June 27, 2012, 541 days later. If it is inspected on December 18, 2011, it becomes overdue on January 1, 2013, since it was not inspected in calendar year 2012.

For railroads or track owners described in paragraphs (a) through (c) of § 237.31, calendar year 2012 is the first full year following their respective required dates of BMP adoption. Therefore, all railroad bridges on these properties must be inspected at least once during 2012. For all other track owners subject to this part required to adopt BMPs by September 13, 2012, the base inspection year will be 2013. All inspections performed on or after the required date of BMP adoption must comply with the requirements and procedures spelled out in the track owner's BMP.

The BSS do not prescribe an inspection procedure—that decision is left to the RBE. It is quite likely that the engineer might prescribe varying levels of detail for inspections performed at different periods, depending on the configuration and condition of the bridge.

(b) A bridge shall be inspected more frequently than provided for in the bridge management program when a railroad bridge engineer determines that such inspection frequency is necessary considering conditions noted on prior inspections, the type and configuration of the bridge, and the weight and frequency of traffic carried on the bridge.

Guidance. This paragraph requires that a bridge shall be inspected more frequently than the period referenced in paragraph (a), above, when a railroad bridge engineer determines that such inspection frequency is necessary. The responsibility for adequate inspection remains with the track owner, with the conditions prescribed by an RBE. The inspection regimen for every bridge should be determined from its condition, configuration, environment, and traffic levels.

(c) Each bridge management program shall define requirements for the special inspection of a bridge to be performed whenever the bridge is involved in an event which might have compromised the integrity of the bridge, including but not limited to a flood, fire, earthquake, derailment or vehicular or vessel impact.

Guidance. It is essential that railroad traffic be protected from possible bridge failure resulting from damage from an event caused by natural or non-railroad agents. The track owner should have in place a means to receive notice of such an event, including weather and earthquakes, and a procedure to conduct an inspection following such an event.

(d) Any railroad bridge that has not been in railroad service and has not been inspected in accordance with this section within the previous 540 days shall be inspected and the inspection report reviewed by a railroad bridge engineer prior to the resumption of railroad service.

Guidance. The inspection frequency requirements of this section do not apply to bridges that are not in railroad service. Clearly the operation of a revenue train constitutes "railroad service;" however, FRA also considers test trains and deadhead equipment moves to be included. During the restoration of a track supported by bridges that have been out of service and not inspected within the previous 540 days, the operation of work trains, including similar equipment capable of moving rail cars, may be done at the discretion of the RBE. It is not the intent that an inspection must be performed and documented in accordance with the track owner's adopted BMP, but rather that the RBE is responsible for determining that the bridges are safe for the passage of the work trains. Operation of hi-rail or on-track maintenance-of-way equipment for the purpose of clearing sufficient trees and brush necessary to access and assess the track and bridges is permitted for a reasonable, short period of time, after which the RBE must perform a bridge evaluation sufficient to assure continued bridge safety during the restoration.

FRA notes that although inspections are not required on out-of-service railroad bridges, State law regarding responsibility for damage to outside parties that might be caused by the

condition of the bridge is not affected. If a bridge not in service has been inspected within the 540-day period, the track owner may accept that inspection and begin railroad service, subject to any determination in that regard by a railroad bridge engineer. If a bridge not in service has **not** been inspected within the previous 540 days, an inspection must be performed and the inspection report reviewed by an RBE before railroad service may resume.

It is common practice for railroads to store surplus rail cars on unused tracks for an extended period of time. Where cars have been stored, access to inspect or otherwise evaluate the condition of the out-of-service bridges may not be practicable. In such a case, FRA will allow the track owner to remove the cars from the affected bridges; however, before any further rail equipment may move across the out-of-service bridges, they must be inspected and the reports reviewed by an RBE.

§ 237.103 Bridge inspection procedures

(a) Each bridge management program shall specify the procedure to be used for inspection of individual bridges or classes and types of bridges.

(b) The bridge inspection procedures shall be as specified by a railroad bridge engineer who is designated as responsible for the conduct and review of the inspections. The inspection procedures shall incorporate the methods, means of access, and level of detail to be recorded for the various components of that bridge or class of bridges.

(c) The bridge inspection procedures shall ensure that the level of detail and the inspection procedures are appropriate to: the configuration of the bridge; conditions found during previous inspections; the nature of the railroad traffic moved over the bridge (including equipment weights, train frequency and length, levels of passenger and hazardous materials traffic); and vulnerability of the bridge to damage.

(d) The bridge inspection procedures shall be designed to detect, report and protect deterioration and deficiencies before they present a hazard to safe train operation.

Guidance. In this section, FRA requires that each BMP specify the procedure to be used for inspection of individual bridges or classes and types of bridges. As mandated by the RSIA, FRA states that the bridge inspection procedures must be as specified by an RBE who is designated as responsible for the conduct and review of the inspections (RSIA Section 417(b)(7)(A)). In the RSIA, Congress also mandated that the bridge safety regulations must "ensure that the level of detail and the inspection procedures are appropriate to the configuration of the bridge, conditions found during the previous inspections, and the nature of the railroad traffic moved over the bridge, including car weights, train frequency and lengths, levels of passenger and hazardous materials traffic, and vulnerability of the bridge to damage." Accordingly, FRA requires that the bridge inspection procedures must ensure that the level of detail and the inspection procedures are appropriate to the configuration of the bridge. Additionally, the bridge inspection procedures must be designed to detect, report, and protect deterioration and deficiencies before they present a hazard to safe train operation. The responsibility for adequate inspection remains with the track owner, with the conditions

prescribed by an RBE. The inspection regimen for every bridge should be determined from its condition, configuration, environment, and traffic levels. The instructions for bridge inspection may be both general, as by bridge type or line segment, and specific, as needed by particular considerations for an individual bridge.

Bridge inspection procedures can be established by an RBE, either as an employee of or as a consultant to the track owner. The RBE is not required to be on site, or even on the property, during an inspection. A primary purpose of the audit procedure called out in § 237.153 is to permit the RBE to review and monitor the effectiveness of the bridge inspection program that has been conducted under his or her overall charge.

In instances where a bridge is shared and supports both railroad and highway loads, the track owner is responsible for the inspection of all members or components that fall within the track-supporting load path. In the case of members or components that support both railroad and highway loads, the evaluation of conditions and load capacity must consider the combined effect of stresses caused by both sources.

In specifying the bridge inspection procedures, it is permissible for a track owner to adopt specific chapters or sections of the AREMA Bridge Inspection Handbook by reference; however, each RBI must have ready access to a copy of the handbook and be cognizant of its contents.

§ 237.105 Special Inspections

(a) Each bridge management program shall prescribe a procedure for protection of train operations and for inspection of any bridge that might have been damaged by a natural or accidental event, including but not limited to a flood, fire, earthquake, derailment or vehicular or vessel impact.

Guidance. In this paragraph, FRA requires that each BMP prescribe a procedure for protection of train operations and for inspection of any bridge that might have been damaged by a natural or accidental event, including flood, fire, earthquake, derailment, or vehicular or vessel impact. It is essential that railroad traffic be protected from possible bridge failure caused by damage from an event caused by natural or non-railroad agents. The track owner should have in place a means to receive notice of such an event, including weather conditions and earthquakes, and a procedure to conduct an inspection following such an event. In order for these procedures to effectively protect train operations, instructions detailing the required responses including any restrictions must be issued to those transportation personnel responsible for the dispatching and operations of trains. It should be noted that all special inspections performed by a designated RBI must be documented as required by § 237.109(a). During or following natural events that encompass a widespread area such as flooding or an earthquake, it is typical for track inspectors to patrol their territory looking out for signs of damage or instability. Bridge observations made during these patrols serve as triage but do not need to be documented as bridge inspections. Where questionable conditions are noted, a designated RBI must be dispatched to perform a documented inspection.

Because natural or accidental events cannot be predicted, and a designated RBI may not be readily available, it is acceptable for a person that is not a designated RBI to respond to the scene and relay information to the designated RBI by telephone, two-way radio, or other means of communications. If the first responder on site can convey to the RBI an accurate description of the bridge condition, the RBI may authorize railroad operations to resume with or without restrictions, as appropriate. Should the RBI be unable to make that decision due to some level of structural damage described by the first responder, the RBI may consult with a designated RBE. If the RBE is satisfied with his understanding of the damage, the RBE may authorize resumption of train operations, with or without restrictions—it does not have to go back to the RBI for that authorization. However, the RBI must file an inspection report documenting the circumstances and their determination. The procedure should specify that when the RBI does not respond immediately, the RBI will perform a followup inspection and file a report accordingly. This report should include an indication that the inspection was made in response to an emergency event that happened on a previous date.

There may also be instances where the first responder must communicate directly with, and receive guidance from, the RBE. This action is acceptable in the case of an emergency inspection since the RBE is ultimately responsible for determining the safe loading conditions for railroad bridges and providing guidance to the RBI. This situation highlights one reason why a track owner would be well served to designate an individual not just as an RBE, but also as an RBI, and possibly an RBS, provided the individual is qualified to perform these functions. The track owner's BMP should specify the procedure by which a non-RBI first responder can be used to respond to an emergency event and then communicate with an RBI or RBE.

(b) Each bridge management program shall provide for the detection of scour or deterioration of bridge components that are submerged, or that are subject to water flow.

Guidance. In this paragraph, FRA requires that each BMP provide for the detection of scour or deterioration of bridge components that are submerged or subject to water flow. The condition of bridge components located underwater is usually not evident from above. Means to determine their condition might be as simple as using measuring rods from the surface, or might call for either periodic or special diving inspections. Advanced technology might also provide devices that can be used to determine underwater conditions. This rule does not prescribe a particular frequency for underwater inspections; that decision is left to the RBE, to be based on the particular conditions at each bridge.

§ 237.107 Conduct of bridge inspections

Bridge inspections shall be conducted under the direct supervision of a designated railroad bridge inspector, who shall be responsible for the accuracy of the results and the conformity of the inspection to the bridge management program.

Guidance. In this section, FRA requires that bridge inspections be conducted under the direct supervision of a designated RBI, who shall be responsible for the accuracy of the results and the conformity of the inspection to the BMP. Bridge inspections can often require more than

one person for safety and efficiency. This provision permits others to assist the designated inspector, who remains responsible for the results of the inspection.

Direct supervision does not absolutely require the designated RBI to be on site. The intent is that the RBI be on site during an inspection; however, FRA interprets "direct supervision" to allow for limited exceptions to the RBI being on site, such as responding to an accidental or natural event when a designated RBI is not reasonably available. As an example, it is permissible for the railroad to dispatch a roadmaster to a bridge strike to inspect the track structure and also relay pertinent information to the designated RBI concerning the condition of the bridge, including any damage. Based on the information provided during some form of two-way communication, the RBI could make a decision concerning the operation of trains. The RBI remains responsible for the decision, and is still required to promptly follow up with an on-site inspection. If use of this limited exception becomes common practice as a matter of convenience rather than there being a bona fide excess delay in having an RBI respond, FRA will consider such abuse as unacceptable.

§ 237.109 Bridge inspection records

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

Guidance. In this section, FRA requires that each track owner to which this part applies keep a record of each inspection required to be performed under this part. A bridge inspection has little value unless it is recorded and reported to the individuals who are responsible for the ultimate determination of the safety of the bridge. Bridge inspectors may use a variety of methods to record their findings as they move about the bridge. These may include notebooks, voice recordings, having another individual transcribe notes, and photographs. These notes and other items are usually compiled into a prescribed report format at the end of the day or at the conclusion of the inspection.

(b) Each record of an inspection under the bridge management program prescribed in this part shall be prepared from notes taken on the day(s) the inspection is made, supplemented with sketches and photographs as needed. Such record will be dated with the date(s) the physical inspection takes place and the date the record is created, and it will be signed or otherwise certified by the person making the inspection.

Guidance. Inspection of a large or complex bridge may take more than 1 day. This paragraph requires that the bridge inspection record include a notation of all dates during which the inspection was being conducted. Indicating just the beginning and ending dates, or just the ending date is not acceptable. If the record documents inspection work that was performed on more than 1 day, each individual date must be shown. It is acceptable for the multiple dates to be shown in a notation rather than in the report header when the format of the inspection record does not allow multiple dates in the header. The method by which multiple inspection dates are to be documented should be specified in the owner's BMP.

In many instances, inspection records are not filled out on the day of the inspection but are created back in an office several days or weeks following the completion of the physical inspection. This practice necessitates the requirement that the inspection record must reflect both the date(s) of inspection as well as the date that the inspection record is completed and signed.

There is no requirement that the designated RBI personally fill out a paper report form or input an electronic record. Using another individual to perform these tasks is permissible, and may be desirable, so long as the designated RBI responsible for conducting the inspection reviews and signs or certifies the report. Ultimately, the designated RBI is responsible for the accuracy of the report and ensuring that it adequately describes the condition of the bridge.

(c) Each bridge management program shall specify that every bridge inspection report shall include, as a minimum, the following information:
(1) A precise identification of the bridge inspected;
(2) The date on which the physical inspection was completed;
(3) The identification and written or electronic signature of the inspector;
(4) The type of inspection performed, in conformance with the definitions of inspection types in the bridge management program;
(5) An indication on the report as to whether any item noted thereon requires expedited or critical review by a railroad bridge engineer, and any restrictions placed at the time of the inspection;
(6) The condition of components inspected, which may be in a condition reporting format prescribed in the bridge management program, together with any narrative descriptions necessary for the correct interpretation of the report; and
(7) When an inspection does not encompass the entire bridge, the portions of the bridge which were inspected shall be identified in the report.

Guidance. In paragraph (c), FRA delineates the essential elements that must be addressed and reported in any bridge inspection.

Section 237.109(c)(4) requires each report to indicate the type of inspection performed using one of the inspection types that must be defined in the BMP. Example inspection types may include annual, periodic, interim, rating, detailed, special, emergency, post-event, etc. The method used to indicate the type of inspection could be a check box, in writing, by using a different identified report format for each type of inspection, or other means defined in the BMP.

Section 237.109(c)(5) requires "[a]n indication on the report as to whether any item noted thereon requires expedited or critical review by a railroad bridge engineer, and any restrictions placed at the time of the inspection."

The report needs to have a means of flagging the report for expedited or critical review. Lack of such indication is understood to mean no expedited or critical review is recommended. The track owner could, for example, set up the report with a yes or no check box to indicate that an expedited or critical review is recommended, so that an inspector's oversight does not

result in a seriously deficient condition being overlooked. For electronic recordkeeping, the system used must provide a method for the RBI to flag a record for expedited or critical review so that the inspection record goes to the top of the pile and potentially follows a parallel path around the normal review and approval path. The BMP must specify the manner in which reports or records will be flagged for expedited or critical review.

The same conditions would apply to notations concerning restrictions placed at the time of inspection. The lack of a restriction notation would be taken to mean no restrictions were placed. The BMP must specify the procedure to be used for recording restrictions placed at the time of the inspection.

Section 237.109(c)(6) requires that the report show "[t]he condition of components inspected…." FRA expects the inspection record to be a condition report where the current state of all components or classes of components is recorded, not an exception report where only the condition of deficient components is recorded and all others are assumed to be in a like-new condition and functioning as intended. Unless a condition assessment is assigned to a component or class of components, there is no indication that these items were even inspected. Taken to the extreme, a bridge that is in like-new condition might show just the header information, date of the inspection, date of report creation, and the inspector's identification. A report containing only these pieces of information would be defective.

Where a structural element is typically hidden from view, such as abutment footings or piles beneath a pier, the condition is normally evaluated by observing the behavior and condition of structural elements that are supported by the hidden element. In such a case, no sign of distress may be inferred to mean that nothing is wrong. If an element is hidden but should not be, such as bridge seats buried in ballast, then the report should indicate that the element could not be inspected and the reason.

The regulation does not specify how the track owner must format the inspection report, only that it be able to capture "[t]he condition of components inspected, which may be in a condition reporting format prescribed in the bridge management program, together with any narrative descriptions necessary for the correct interpretation of the report." The key here is that there is **sufficient** "narrative description necessary for the correct interpretation of the report." Where the reporting format does not divide members into discrete elements, adequate narrative is essential, especially for elements that are in less than good condition. The level of detail provided must be sufficient for the RBE to evaluate the severity of conditions, considering the combined effects of multiple deficient conditions, in order to determine both localized and overall structural integrity.

Neither does the regulation define what constitutes a component. In the case of a riveted deck plate girder span with an open deck, one bridge inspection program might attempt to define the components to be the deck, superstructure, and substructure. FRA believes that the deck, superstructure, and substructure are not components but rather groups of components and would find this inadequate. Alternatively, a second program could break down these global systems further to include ties, tie spacers, hook bolts, girders, cross bracing, lateral bracing systems, abutments, piers, backwalls, and bridge seats. A third program might break the

girders down into even smaller elements such as top flange, bottom flange, flange angles, web, intermediate stiffeners, bearing stiffeners sole plates, and anchor bolts. FRA expects, at a minimum, conditions to be assessed for all steel superstructure components at the level of stringers, floor beams, floor system bracing, multi-beams, and girders. For trusses, FRA expects that the truss be divided at a minimum into inspection units consisting of upper chords, web members (hangers, diagonals, and posts), lower chords, bearings, lateral bracing, sway bracing, and portals.

FRA would prefer that a report indicate the conditions of the individual elements making up a primary load-carrying member; however, as long as sufficient narrative, sketches, or photographs are supplied with the report to enable the reviewer to evaluate the severity and extent of deficient conditions, compliance with the regulations would be achieved. FRA would not expect a narrative for a member or component categorized as being in excellent or good condition; but once the condition dropped to fair or worse, an indication of the reason for that assessment is warranted and expected. If the track owner's BMP and associated bridge inspection program do not require such explanation, then the program is defective.

In reviewing the adequacy of a bridge inspection report, the FRA inspector should compare a report prepared in conformance with the track owner's BMP to the actual conditions found in the field, and then evaluate whether the report conveys sufficient, accurate information to the RBE to make an informed decision on the state of the bridge.

(d) An initial report of each bridge inspection shall be placed in the location designated in the bridge management program within 30 calendar days of the completion of the inspection unless the complete inspection report is filed first. The initial report shall include the information required by paragraphs (c)(1) through (c)(5) of this section.

Guidance. In this paragraph, FRA requires that an initial report of each bridge inspection be placed in the location designated by the BMP within 30 calendar days of the completion of the field portion of the inspection. If the complete report as described in § 237.109(e) is filed within 30 days of the completion of the inspection, an initial report is not required. The initial report must include the information delineated in paragraphs (c)(1) through (c)(5). The actual conduct of the inspection should be reported and recorded, showing the fact that the bridge was actually inspected on a certain date, the type of inspection performed, by whom it was performed, and whether any critical conditions were detected. Inspection and reporting procedures vary widely among different railroads and circumstances. In many cases, especially on larger railroads, an inspector would prepare the report before leaving the bridge. The reports might be forwarded by mail, by electronic means, or by hand delivery. They might be forwarded daily, weekly, or even less frequently. In other circumstances, a consulting engineer might be engaged by a small railroad to inspect all of the bridges on all or part of the line, and the final report might be prepared by the engineering firm after all of the inspections are completed. Similarly, a large railroad might begin a comprehensive inspection and evaluation of a large structure that will take several months to complete.

FRA recognizes the wide range of time periods required for these various inspections and reporting procedures, so this provision was developed as a means for the track owner to monitor inspection progress, bridge by bridge, with a simple line item showing:

1. Identification of the bridge inspected.
2. Date of completion of the inspection.
3. Identification of the inspector.
4. Type of inspection performed.
5. Indication on the report as to whether any item noted thereon requires expedited or critical review by a railroad bridge engineer, and any restrictions placed at the time of the inspection.

These five items can usually be listed on a single line of a report. The initial report might include all of the bridges inspected by one individual in 1–2 weeks. FRA does not anticipate that the initial or summary report include all of the data called for in the BMP, together with any narrative descriptions necessary for the correct interpretation of the report. This information would be included in the complete inspection report.

Since FRA cannot be present onsite at each bridge inspection, the agency must see a record that shows that the inspection was performed, when and by whom it was performed, and the conditions found in the inspection.

FRA views the interim report as a management tool in the bridge program audit to show whether bridge inspections are being performed at or near their scheduled frequency, with ample time to permit adjustments as necessary in the inspection program.

An effective BMP requires that the person in charge of the program have reasonably current information on the progress of the vital function of bridge inspection.

(e) A complete report of each bridge inspection, including as a minimum the information required in paragraphs (c)(1) through (c)(6) of this section, shall be placed in the location designated in the bridge management program within 120 calendar days of the completion of the inspection.

Guidance. In this paragraph, FRA requires that a complete report of each bridge inspection shall be placed in the location designated in the BMP within 120 days of the completion of the field portion of the inspection. A bridge inspection is not complete until the report of the inspection is filed and available to the people who are responsible for the management of the bridges inspected. This time period does not include the time used by a consultant or in-house engineering group to complete an analysis of the results of the inspection, and it is not expected that the analysis must be completed within that time period. In cases where a detailed analysis is required, FRA intends that the inspection report on which the analysis is based would be separated from the analysis itself and filed within the required timeframe.

FRA understands the circumstances in which a consultant is engaged to conduct detailed bridge inspections and evaluations. Some of those evaluations include a considerable amount of engineering work that is performed in an office rather than in the field, and several months

are often used in preparing the complete report. The extension of the time period for filing the report is intended to allow the most efficient use of inspection and engineering resources, while still providing effective input for management by the bridge owner and FRA monitoring.

(f) Each bridge inspection program shall specify the retention period and location for bridge inspection records. The retention period shall be no less than two years following the completion of the inspection. Records of underwater inspections shall be retained until the completion and review of the next underwater inspection of the bridge.

Guidance. This paragraph requires that each bridge inspection program specify the retention period and location for bridge inspection records. The retention period must be at least 2 years from the completion of the physical inspection. A comparison of successive reports can reveal any accelerating rates of deterioration or degradation of bridge components. Additionally, an audit or review of the effectiveness of a bridge inspection program requires comparison of previous inspection reports with the actual condition of a bridge included in the audit. The practice of comparing previous inspection reports with actual bridge conditions has been followed by FRA for more than a decade when evaluating railroad BMPs. It is a valuable factor in determining the effectiveness of a railroad's program.

For purposes of enforcement, an FRA inspector cannot look back any further than the regulations require, even if the track owner's BMP specifies a longer retention period. In a case where bridge inspection records have been retained for at least 2 years but less than required by the BMP, the inspector should indicate in a comment to the railroad that it has failed to comply with its own BMP.

(g) If a bridge inspector, supervisor, or engineer discovers a deficient condition on a bridge that affects the immediate safety of train operations, that person shall report the condition as promptly as possible to the person who controls the operation of trains on the bridge in order to protect the safety of train operations.

Guidance. Once it is determined that a condition affects the immediate safety of train operations, the first notification made must be to the person who controls the operation of trains. Requiring the party who discovered the deficient condition to make the first notification to anyone else is unacceptable.

§ 237.111 Review of bridge inspection reports

Bridge inspection reports shall be reviewed by railroad bridge supervisors and railroad bridge engineers to:

(a) Determine whether inspections have been performed in accordance with the prescribed schedule and specified procedures;
(b) Evaluate whether any items on the report represent a present or potential hazard to safety;
(c) Prescribe any modifications to the inspection procedures or frequency for that particular bridge;

(d) Schedule any repairs or modifications to the bridge required to maintain its structural integrity; and
(e) Determine the need for further higher-level review.

Guidance. The RSIA requires that an engineer who is competent in the field of railroad bridge engineering reviews all inspection reports and determines whether bridges are being inspected according to the applicable procedures and frequencies, and reviews any items noted by an inspector as exceptions (RSIA Section 417(b)(7)). In this section, FRA requires responsible supervisors and RBEs to review bridge inspection reports. Bridge inspection is usually a multitiered procedure. The RBI reports on the conditions noted in the inspection, but an RBE will necessarily evaluate those noted conditions and determine what, if any, further action is required.

The regulation does not require that an RBE review every inspection report, so long as the responsible management personnel keep track of the conduct of inspections to see that they are performed in accordance with the schedule and other requirements of this rule and the track owner's program. It should be a simple matter for the inspector to indicate on a report whether the report would require higher-level or engineering review. The engineering staff would review the reports that indicate problems or issues for them to resolve. Section 237.153, Audits of inspections, includes a provision for sampling of routine inspection reports to assure that the RBIs are properly identifying reports that require review. Regardless of whether a report is "flagged" for higher level or engineering review, all reports must be reviewed by at least a responsible supervisor or manager. While there is no specific regulatory requirement that a track owner document the fact that individual reports have been reviewed, failing to do so will likely impede the audit process.

The addition of the signature or initials of the individual that is reviewing an inspection report should not be viewed as changing the report, nor should any annotations made by the reviewer as long as it is apparent that someone other than the RBI made the addition and that individual is identified.

Subpart F – Repair and Modification of Bridges

Guidance. This subpart establishes minimum standards to be incorporated in railroad BMPs to provide for adequate design and effective supervision of those bridge modifications and repairs, which will materially modify the capacity of the bridge or the stresses in any primary load-carrying component of the bridge. This section provides for correct design and adequate supervision of repair and modification of bridges where the work could materially affect the capacity of the bridge, or its continued integrity. FRA does not intend that minor repairs that do not affect the capacity of the bridge must be designed by an engineer, but the supervision of that work should be performed by a person who is competent to assure that the work does not inadvertently compromise the integrity of the bridge.

§ 237.131 Design

Each repair or modification which materially modifies the capacity of a bridge or the stresses in any primary load-carrying component of a bridge shall be designed by a railroad bridge engineer. The design shall specify the manner in which railroad traffic or other live loads may be permitted on the bridge while it is being modified or repaired. Designs and procedures for repair or modification of bridges of a common configuration, such as timber trestles, or instructions for in-kind replacement of bridge components, may be issued as a common standard. Where the common standard addresses procedures and methods that could materially modify the capacity of a bridge or the stresses in any primary load-carrying component of a bridge, the standard shall be designed and issued by a qualified railroad bridge engineer.

Guidance. Design of entire railroad bridges, modifications, and repairs that materially modify the capacity of the bridge or the stresses in any primary load-carrying component of the bridge require the intelligent application of the principles of engineering and can be performed only by an engineer with training and experience in the field of railroad bridges. Railroads have typically issued standard instructions for the performance of common maintenance repairs, such as replacement or upgrading of components of timber trestles. This section specifically permits such a practice; however, any instruction or procedure that carries the potential to impair the ability of a bridge to carry rail equipment while being performed must be issued by a qualified RBE. For example, a standard procedure used for the in-kind replacement of steel floor system primary members would need to specify the number of rivets or bolts that could be removed from a connection and still safely carry trains, or else clearly prohibit the operation of any trains while certain portions of the work are in progress. For purposes of this part, a primary load-carrying component is a railroad bridge component, the failure of which would immediately compromise the structural integrity of the bridge.

In general terms, the regulation requires the design of repairs or modifications that affect the safe load capacity of a bridge to be done by an RBE. The regulations are silent about the design of a new railroad bridge. Track owners should be encouraged to include language in their BMPs indicating what design specification will be used for new bridges as well as repairs or modifications to existing structures. The AREMA Manual for Railway Engineering would be an appropriate design standard, and Guideline 5, Specifications for design and rating

of railroad bridges, Part 237, Appendix A, can be used as the guiding principle. However the American Association of State Highway and Transportation Officials bridge code, or any building code, would not be appropriate design standards.

§ 237.133 Supervision of repairs and modifications

Each repair or modification pursuant to this part shall be performed under the immediate supervision of a railroad bridge supervisor as defined in § 237.55 of this part who is designated and authorized by the track owner to supervise the particular work to be performed. The railroad bridge supervisor shall ensure that railroad traffic or other live loads permitted on the bridge under repair or modification are in conformity with the specifications in the design.

Guidance. This section requires that each repair or modification pursuant to this part shall be performed under the immediate supervision of an RBS as defined in § 237.55 of this part who is designated and authorized by the track owner to supervise the particular work to be performed. Modifications and repairs that materially modify the capacity of the bridge or the stresses in any primary load-carrying component of the bridge must be performed according to the specific or general specifications and instructions issued by an RBE. The term "immediate supervision" means that the RBS is on site to ensure the repairs or modifications are performed in accordance with the specifications and instructions. Particularly when trains are permitted to pass over a bridge that is being repaired or modified, the supervisor at the bridge must be able to make the necessary determination to either permit, restrict, or halt train operations depending on the state of the bridge. As this part does not specify the employment relationship between the track owner and the bridge supervisor, the track owner may designate a contractor or a consultant as the RBS. It is necessary, however, that a qualified individual be responsible for the proper and safe performance of work on a bridge, and that the individual be authorized to perform the actions necessary to fulfill that responsibility.

FRA intends that the requirement for an RBS to supervise repairs or modifications would be limited to work performed at the actual construction site and would not extend to the manufacture of prefabricated components at a steel fabricator's or precast concrete supplier's facility. In these cases, it is expected that the purchase order or contract requires the supplier to provide components that are manufactured or fabricated in accordance with the track owner's plans and specifications, and for the supplier to have adequate quality assurance or quality control procedures in place.

Subpart G – Documentation, Records and Audits of Bridge Management Programs

Guidance. Documentation is essential to any effective management program. In Subpart G, FRA establishes minimum standards to be incorporated in railroad BMPs to provide for verification of the effectiveness of the program and the accuracy of the information developed thereby, by the track owner, and by FRA to evaluate compliance with this regulation.

§ 237.151 Audits; general

Each program adopted to comply with this part shall include provisions for auditing the effectiveness of the several provisions of that program, including the validity of bridge inspection reports and bridge inventory data, and the correct application of movement restrictions to railroad equipment of exceptional weight or configuration.

Guidance. In this section, FRA requires that each program adopted to comply with this part include provisions for auditing the effectiveness of the several provisions of that program, including the validity of bridge inspection reports and bridge inventory data, and the correct application of movement restrictions to railroad equipment of exceptional weight or configuration. Effective management of a safety-critical program requires an adequate level of review to assure that the requisite work is being performed correctly. The audit provisions should identify the entity that is going to perform the audit, the frequency of the audit, and list the specific items that will be audited.

The regulation does not specify who should conduct the internal audit. But general audit principles would not permit the auditor and/or the person being audited to be the same individual employee or consulting firm. Since the track owner is ultimately responsible for the integrity of the program, the track owner or its organization should at least be represented on the audit even if the representative is not a designated RBE or RBI.

A track owner that performs its own bridge management functions, such as inspections, may audit its own program. The only caveat is that an individual should not audit his or her own work. Of course that person could participate in the audit process as the person being audited.

§ 237.153 Audits of inspections

(a) Each bridge management program shall incorporate provisions for an internal audit to determine whether the inspection provisions of the program are being followed, and whether the program itself is effectively providing for the continued safety of the subject bridges.

(b) The inspection audit shall include an evaluation of a representative sampling of bridge inspection reports at the bridges noted on the reports to determine whether the reports accurately describe the condition of the bridge.

Guidance. FRA has found over the years during which it has conducted evaluations of railroad bridge programs that one of the most important indicators of the effectiveness of a

program is a comparison of recent bridge inspection reports against actual conditions found at the subject bridges. This is fundamental to an effective audit of a BMP. Therefore, each BMP shall incorporate provisions for an internal audit to determine whether the inspection provisions of the program are being followed, and whether the program itself is effectively providing for the continued safety of the subject bridges. Additionally, the inspection audit shall include an evaluation of a representative sampling of bridge inspection reports at the bridges noted on the reports to determine whether the reports accurately describe the condition of the bridge.

§ 237.155 Documents and records

Each track owner required to implement a bridge management program and keep records under this part shall make those program documents and records available for inspection and reproduction by the Federal Railroad Administration.

Guidance. In this section, FRA requires each track owner required to implement a BMP and keep records under this part to make those program documents and records available for FRA inspection and reproduction. This section addresses Congress' mandate in the RSIA to establish a program to periodically review bridge inspection and maintenance data from railroad carrier bridge inspectors and FRA bridge experts (RSIA Section 417(d)). FRA will require access to the vital documents and records of the various BMPs to enable it to carry out its enforcement responsibilities.

(a) Electronic recordkeeping; general. For purposes of compliance with the recordkeeping requirements of this part, a track owner may create and maintain any of the records required by this part through electronic transmission, storage, and retrieval provided that all of the following conditions are met:

(1) The system used to generate the electronic record meets all requirements of this subpart;
(2) The electronically generated record contains the information required by this part;
(3) The track owner monitors its electronic records database through sufficient number of monitoring indicators to ensure a high degree of accuracy of these records;
(4) The track owner shall train its employees who use the system on the proper use of the electronic recordkeeping system; and
(5) The track owner maintains an information technology security program adequate to ensure the integrity of the system, including the prevention of unauthorized access to the program logic or individual records.
(b) System security. The integrity of the bridge inspection records must be protected by a security system that incorporates a user identity and password, or a comparable method, to establish appropriate levels of program and record data access meeting all of the following standards:
(1) No two individuals have the same electronic identity;
(2) A record cannot be deleted or altered by any individual after the record is certified by the employee who created the record;
(3) Any amendment to a record is either—
(i) Electronically stored apart from the record that it amends; or

(ii) Electronically attached to the record as information without changing the original record;
(4) Each amendment to a record uniquely identifies the person making the amendment; and
(5) The electronic system provides for the maintenance of inspection records as originally submitted without corruption or loss of data.

Guidance. In these paragraphs, FRA establishes minimum standards for electronic recordkeeping provisions that a track owner may elect to use to comply with the recordkeeping provisions of this part. FRA recognizes the growing prevalence of electronic records, and acknowledges the unique challenges that electronic transmission, storage, and retrieval of records can present. To allow for future advances in technology, FRA is establishing electronic record storage provisions in these paragraphs that are technology-neutral.

For purposes of complying with the recordkeeping requirements of this part, a track owner may create and maintain any of the required records through electronic transmission, storage, and retrieval, provided that certain conditions are met. Not only must the system used to generate the electronic records meet all of the requirements of this subpart and the records contain all of the information required by this subpart, but the track owner must also: (1) monitor the electronic database through a sufficient number of monitoring indicators to ensure a high degree of the accuracy of the records; (2) train the employees who use the system on the proper use of the system; and (3) maintain an information technology security program adequate to ensure the integrity of the system, including the prevention of unauthorized access to the program logic or individual records.

Additionally, as specified in the BSS, the integrity of the bridge inspection records must be protected by a security system that incorporates user identity and password, or a comparable method, to establish appropriate levels of program and inspection record data access meeting all of the following standards: (1) no two individuals can have the same electronic identity; (2) a bridge inspection record cannot be deleted or altered by any individual after the record is certified by the employee who created the record; (3) any amendment to the record must either be electronically stored apart from the record it amends, or electronically attached to the record as information without changing the original record; (4) each amendment to a record must uniquely identify the person making the amendment; and (5) the electronic system must provide for the maintenance of inspection records as originally submitted without corruption or loss of data.

There must be a record of each inspection made and it must be retrievable. Subsequent inspections cannot alter the previous record to the extent that a reviewer is unable to determine the content of the earlier record.

Appendix A – Supplemental Statement of Agency Policy on the Safety of Railroad Bridges

A Statement of Agency Policy on the Safety of Railroad Bridges was originally published by FRA in 2000 as Appendix C of the Federal Track Safety Standards, 49 CFR Part 213. With the promulgation of 49 CFR Part 237, Bridge Safety Standards, many of the non-regulatory provisions in that Policy Statement have been incorporated into the bridge safety standards in this part.

However, FRA has determined that other non-regulatory items are still useful as information and guidance for track owners. Those provisions of the Policy Statement are therefore retained and placed in this Appendix in lieu of their former location in the Track Safety Standards.

Guidance. This appendix is included in this compliance manual as information only. This statement of agency policy is non-regulatory, and in any instance where information contained herein conflicts with regulatory requirements, the regulatory language shall prevail.

GENERAL

1. The structural integrity of bridges that carry railroad tracks is important to the safety of railroad employees and to the public. The responsibility for the safety of railroad bridges is specified in § 237.3, "Responsibility for compliance."

2. The capacity of a bridge to safely support its traffic can be determined only by intelligent application of engineering principles and the law[s] of physics. Track owners should use those principles to assess the integrity of railroad bridges.

3. The long term ability of a structure to perform its function is an economic issue beyond the intent of this policy. In assessing a bridge's structural condition, FRA focuses on the present safety of the structure, rather than its appearance or long term usefulness.

4. FRA inspectors conduct regular evaluations of railroad bridge inspection and management practices. The objective of these evaluations is to document the practices of the evaluated railroad, to disclose any program weaknesses that could affect the safety of the public or railroad employees, and to assure compliance with the terms of this regulation. If the evaluation discloses problems, FRA seeks a cooperative resolution. If safety is jeopardized by a track owner's failure to resolve a bridge problem, FRA will use appropriate measures, including assessing civil penalties and issuance of emergency orders, to protect the safety of railroad employees and the public.

5. This policy statement addresses the integrity of bridges that carry railroad tracks. It does not address the integrity of other types of structures on railroad property (i.e., tunnels, highway bridges over railroads, or other structures on or over the right-of-way).

6. The guidelines published in this statement are advisory. They do not have the force of regulations or orders, which FRA may enforce using civil penalties or other means. The guidelines supplement the requirements of part 237 and are retained for information and guidance.

GUIDELINES

1. Responsibility for safety of railroad bridges.

(a) The responsibility for the safety of railroad bridges is specified in § 237.3.

(b) The track owner should maintain current information regarding loads that may be operated over the bridge, either from its own engineering evaluations or as provided by a competent engineer representing the track owner. Information on permissible loads may be communicated by the track owner either in terms of specific car and locomotive configurations and weights, or as values representing a standard railroad bridge rating reference system. The most common standard bridge rating reference system incorporated in the Manual for Railway Engineering of the American Railway Engineering and Maintenance of Way Association is the dimensional and proportional load configuration devised by Theodore Cooper. Other reference systems may be used where convenient, provided their effects can be defined in terms of shear, bending and pier reactions as necessary for a comprehensive evaluation and statement of the capacity of a bridge.

(c) The owner of the track on a bridge should advise other railroads operating on that track of the maximum loads permitted on the bridge stated in terms of car and locomotive configurations and weights. No railroad should operate a load which exceeds those limits without specific authority from, and in accordance with restrictions placed by, the track owner.

2. Capacity of railroad bridges.

(a) The safe capacity of bridges should be determined pursuant to § 237.71.

(b) Proper analysis of a bridge requires knowledge of the actual dimensions, materials and properties of the structural members of the bridge, their condition, and the stresses imposed in those members by the service loads.

(c) The factors which were used for the design of a bridge can generally be used to determine and rate the load capacity of a bridge provided:

(i) The condition of the bridge has not changed significantly; and

(ii) The stresses resulting from the service loads can be correlated to the stresses for which the bridge was designed or rated.

3. Railroad bridge loads.

(a) Control of loads is governed by § 237.73.

(b) Authority for exceptions. Equipment exceeding the nominal weight restriction on a bridge should be operated only under conditions determined by a competent railroad bridge engineer who has properly analyzed the stresses resulting from the proposed loads and has determined that the proposed operation can be conducted safely without damaging the bridge.

(c) Operating conditions. Operating conditions for exceptional loads may include speed restrictions, restriction of traffic from adjacent multiple tracks, and weight limitations on adjacent cars in the same train.

4. Railroad bridge records.

(a) The organization responsible for the safety of a bridge should keep design, construction, maintenance and repair records readily accessible to permit the determination of safe loads. Having design or rating drawings and calculations that conform to the actual structure greatly simplifies the process of making accurate determinations of safe bridge loads. This provision is governed by § 237.33.

(b) Organizations acquiring railroad property should obtain original or usable copies of all bridge records and drawings, and protect or maintain knowledge of the location of the original records.

5. Specifications for design and rating of railroad bridges.

(a) The recommended specifications for the design and rating of bridges are those found in the Manual for Railway Engineering published by the American Railway Engineering and Maintenance of Way Association. These specifications incorporate recognized principles of structural design and analysis to provide for the safe and economic utilization of railroad bridges during their expected useful lives. These specifications are continually reviewed and revised by committees of competent engineers. Other specifications for design and rating, however, have been successfully used by some railroads and may continue to be suitable.

(b) A bridge can be rated for capacity according to current specifications regardless of the specification to which it was originally designed.

6. Periodic inspections of railroad bridges.

(a) Periodic bridge inspections by competent inspectors are necessary to determine whether a structure conforms to its design or rating condition and, if not, the degree of nonconformity. See § 237.101. Section 237.101(a) calls for every railroad bridge to be inspected at least once in each calendar year. Deterioration or damage may occur during the course of a year regardless of the level of traffic that passes over a bridge. Inspections at more frequent intervals may be required by the nature or condition of a structure or intensive traffic levels.

7. Underwater inspections of railroad bridges.

(a) Inspections of bridges should include measuring and recording the condition of substructure support at locations subject to erosion from moving water.

(b) Stream beds often are not visible to the inspector. Indirect measurements by sounding, probing, or any other appropriate means are necessary in these cases. A series of records of these readings will provide the best information in the event unexpected changes suddenly occur. Where such indirect measurements do not provide the necessary assurance of foundation integrity, diving inspections should be performed as prescribed by a competent engineer.

8. Seismic considerations.

(a) Owners of bridges should be aware of the risks posed by earthquakes in the areas in which their bridges are located. Precautions should be taken to protect the safety of trains and the public following an earthquake.

(b) Contingency plans for seismic events should be prepared in advance, taking into account the potential for seismic activity in an area.

(c) The predicted attenuation of ground motion varies considerably within the United States. Local ground motion attenuation values and the magnitude of an earthquake both influence the extent of the area affected by an earthquake. Regions with low frequency of seismic events produce less data from which to predict attenuation factors. That uncertainty should be considered when designating the area in which precautions should be taken following the first notice of an earthquake. In fact, earthquakes in such regions might propagate their effects over much wider areas than earthquakes of the same magnitude occurring in regions with frequent seismic activity.

9. Special inspections of railroad bridges.

Requirements for special inspections of railroad bridges are found in § 237.105.

10. Railroad bridge inspection records.

(a) The requirements for recording and reporting bridge inspections are found in § 237.109.

(b) Information from bridge inspection reports should be incorporated into a bridge management program to ensure that exceptions on the reports are corrected or accounted for. A series of inspection reports prepared over time should be maintained so as to provide a valuable record of trends and rates of degradation of bridge components. The reports should be structured to promote comprehensive inspections and effective communication between an inspector and an engineer who performs an analysis of a bridge.

(c) An inspection report should be comprehensible to a competent person without interpretation by the reporting inspector.

11. Railroad bridge inspectors and engineers.

(a) Bridge inspections should be performed by technicians whose training and experience enable them to detect and record indications of distress on a bridge. Inspectors should provide accurate measurements and other information about the condition of the bridge in enough detail so that an engineer can make a proper evaluation of the safety of the bridge. Qualifications of personnel are addressed in Subpart C to Part 237.

(b) Accurate information about the condition of a bridge should be evaluated by an engineer who is competent to determine the capacity of the bridge. The inspector and the evaluator often are not the same individual; therefore, the quality of the bridge evaluation depends on the quality of the communication between them. Review of inspection reports is addressed in § 237.111.

12. Scheduling inspections.

(a) A bridge management program should include a means to ensure that each bridge under the program is inspected at the frequency prescribed for that bridge by a competent engineer. Scheduling of bridge inspections is addressed in § 237.101.

(b) Bridge inspections should be scheduled from an accurate bridge inventory list that includes the due date of the next inspection.

13. Special considerations for railroad bridges.

Railroad bridges differ from other types of bridges in the types of loads they carry, in their modes of failure and indications of distress, and in their construction details and components. Proper inspection and analysis of railroad bridges require familiarity with the loads, details and indications of distress that are unique to this class of structure. Particular care should be taken that modifications to railroad bridges, including retrofits for protection against the effects of earthquakes, are suitable for the structure to which they are to be applied. Modifications should not adversely affect the serviceability of neither the bridge nor its accessibility for periodic or special inspection.

14. Railroad implementation of bridge safety programs.

FRA recommends that each track owner or other entity which is responsible for the integrity of bridges which support its track should comply with the intent of this regulation by adopting and implementing an effective and comprehensive program to ensure the safety of its bridges. The bridge safety program should incorporate the following essential elements, applied according to the configuration of the railroad and its bridges. The basis of the program should be in one comprehensive and coherent document which is available to all railroad personnel and other persons who are responsible for the application of any portion of the program. The program should include:

(a) Clearly defined roles and responsibilities of all persons who are designated or authorized to make determinations regarding the integrity of the track owner's bridges. The designations may be made by position or by individual;

(b) Provisions for a complete inventory of bridges that carry the owner's track, to include the following information on each bridge:

(1) A unique identifier, such as milepost location and a subdivision code;

(2) The location of the bridge by nearest town or station, and geographic coordinates;

(3) The name of the geographic features crossed by the bridge;

(4) The number of tracks on the bridge;

(5) The number of spans in the bridge;

(6) The lengths of the spans;

(7) Types of construction of:

(i) Substructure;

(ii) Superstructure; and

(iii) Deck;

(8) Overall length of the bridge;

(9) Dates of:

(i) Construction;

(ii) Major renovation; and

(iii) Strengthening; and

(10) Identification of entities responsible for maintenance of the bridge or its different components.

(c) Known capacity of its bridges as determined by rating by competent railroad bridge engineer or by design documents;

(d) Procedures for the control of movement of high, wide or heavy loads exceeding the nominal capacity of bridges;

(e) Instructions for the maintenance of permanent records of design, construction, modification, and repair;

(f) Railroad-specific procedures and standards for design and rating of bridges;

(g) Detailed bridge inspection policy, including:

(1) Inspector qualifications; including:

(i) Bridge experience or appropriate educational training;

(ii) Training on bridge inspection procedures; and

(iii) Training on Railroad Workplace Safety; and

(2) Type and frequency of inspection; including:

(i) Periodic (at least annually);

(ii) Underwater;

(iii) Special;

(iv) Seismic; and

(v) Cursory inspections of overhead bridges that are not the responsibility of the railroad;

(3) Inspection schedule for each bridge;

(4) Documentation of inspections; including:

(i) Date;

(ii) Name of inspector;

(iii) Reporting Format; and

(iv) Coherence of information;

(5) Inspection Report Review Process;

(6) Record retention; and

(7) Tracking of critical deficiencies to resolution; and

(h) Provide for the protection of train operations following an inspection, noting a critical deficiency, repair, modification or adverse event and should include:

(1) A listing of qualifications of personnel permitted to authorize train operations following an adverse event; and

(2) Detailed internal program audit procedures to ensure compliance with the provisions of the program.

Appendix B – Schedule of Civil Penalties

Defect Description (sorted by paragraph)	Code (unsorted)	Violation	Willful Violation
Subpart B – Railroad Bridge Safety Assurance			
237.31 Adoption of bridge management program			
		$9,500	$17,000
237.33 Content of bridge management program			
(a) Inventory of railroad bridges		2,500	5,000
(b) Record of safe load capacity		5,500	10,000
(c) Provision to obtain and maintain:			
(i) Design documents		5,500	10,000
(ii) Documentation of repairs and modifications		2,500	5,000
(iii) Inspection reports		2,500	5,000
(d) Bridge inspection program content		2,500	5,000
Subpart C – Qualifications and Designations of Responsible Persons			
237.51 Railroad bridge engineers			
(a) Competency		5,500	10,000
(b) Educational qualification		2,500	5,000
237.53 Railroad bridge inspectors			
		5,500	10,000

237.55 Railroad bridge supervisors			
		5,500	10,000
237.57 Designation of individuals			
		2,500	5,000
Subpart D – Capacity of Bridges			
237.71 Determination of bridge load capacities			
(a) Safe load capacity		5,500	10,000
(b) Load capacity documented		5,500	10,000
(c) Load capacity determined by a railroad bridge engineer		5,500	10,000
(d) Method of load capacity determination		2,500	5,000
(e) Prioritization of load capacity determination		2,500	5,000
(f) New load capacity determined due to change in condition		2,500	5,000
(g) Load capacity stated in terms of weight and length of equipment		2,500	5,000
(h) Restriction on operations by railroad bridge engineer		5,500	10,000
237.73 Protection of bridges from over-weight and over-dimension equipment			
(a) Instructions issued		5,500	10,000
(b) Weight instructions		2,500	5,000
(c) Dimensional instructions		2,500	5,000
(d) Incorrect instructions issued		2,500	5,000
Subpart E – Bridge Inspection			
237.101 Scheduling of bridge inspections			
(a) Scheduling			

(i) Failure to inspect		9,500	17,000
(ii) Inspection within calendar year		2,500	5,000
(iii) Inspection frequency exceeding 540 days		2,500	5,000
(b) Increased inspection frequency		5,500	10,000
(c) Special inspections		2,500	5,000
(d) Resumption of railroad operations prior to inspection and review		9,500	17,000
237.103 Bridge inspection procedures			
		2,500	5,000
237.105 Special inspections			
(a) Procedures to protect train operations and requiring special inspections		2,500	5,000
(b) Provision for the detection of scour or underwater deterioration		2,500	5,000
237.107 Conduct of bridge inspections			
		5,500	10,000
237.109 Bridge inspection records			
(a) Record of inspection		2,500	5,000
(b) Inspection record			
(i) Certification and date		2,500	5,000
(ii) Falsification			17,000
(c) Inspection record information		2,500	5,000
(d) Initial report within 30 days		2,500	5,000
(e) Final inspection report within 120 calendar days		2,500	5,000
(f) Retention		2,500	5,000

(g) Prompt reporting of dangerous conditions		5,500	10,000
237.111 Review of bridge inspection reports			
(a) Review by railroad bridge engineers and supervisors		2,500	5,000
(b) Appropriate action concerning present or potential safety hazards		5,500	10,000
(c) Modification of inspection frequency or procedures		2,500	5,000
(d) Scheduling remedial action		2,500	5,000
(e) Higher-level review		2,500	5,000
Subpart F – Repair and Modification of Bridges			
237.131 Design			
		5,500	10,000
237.133 Supervision of repairs and modifications			
		5,500	10,000
Subpart G – Documentation, Records and Audits of Bridge Management Programs			
237.151 Audits; general			
		2,500	5,000
237.153 Audits of inspections			
		2,500	5,000
237.155 Documents and records			
(a) Electronic recordkeeping, general		2,500	5,000
(b) System security		2,500	5,000

Appendix C – Defect Codes

CFR	RULE	SUBRULE	DESCRIPTION
237	0031		FAILURE TO ADOPT BRIDGE MANAGEMENT PROGRAM.
237	0033	Ai	LACK OF RAILROAD BRIDGE INVENTORY.
237	0033	Aii	RAILROAD BRIDGE INVENTORY LACKS UNIQUE IDENTIFIER FOR EACH BRIDGE.
237	0033	Aiii	RAILROAD BRIDGE INVENTORY LACKS BRIDGE LOCATION FOR EACH BRIDGE.
237	0033	Aiv	RAILROAD BRIDGE INVENTORY LACKS CONFIGURATION FOR EACH BRIDGE.
237	0033	Av	RAILROAD BRIDGE INVENTORY LACKS TYPE OF CONSTRUCTION FOR EACH BRIDGE.
237	0033	Avi	RAILROAD BRIDGE INVENTORY LACKS NUMBER OF SPANS FOR EACH BRIDGE.
237	0033	Avii	RAILROAD BRIDGE INVENTORY LACKS SPAN LENGTHS FOR EACH BRIDGE.
237	0033	Aviii	RAILROAD BRIDGE INVENTORY LACKS OTHER INFORMATION NECESSARY TO PROVIDE FOR THE MANAGEMENT OF BRIDGE SAFETY.
237	0033	Aix	RAILROAD BRIDGE NOT LISTED IN RAILROAD BRIDGE INVENTORY.
237	0033	B	BRIDGE MANAGEMENT PROGRAM LACKS RECORD OF SAFE LOAD CAPACITY OF EACH BRIDGE.
237	0033	Ci	BRIDGE MANAGEMENT PROGRAM LACKS PROVISION TO OBTAIN AND MAINTAIN THE DESIGN DOCUMENTS OF EACH BRIDGE.
237	0033	Cii	BRIDGE MANAGEMENT PROGRAM LACKS PROVISION TO DOCUMENT ALL REPAIRS AND MODIFICATIONS.
237	0033	Ciii	BRIDGE MANAGEMENT PROGRAM LACKS PROVISION TO DOCUMENT ALL BRIDGE INSPECTIONS.
237	0033	D	BRIDGE MANAGEMENT PROGRAM LACKS BRIDGE INSPECTION PROGRAM CONTENT.
237	0033	D1	BRIDGE INSPECTION PROGRAM LACKS INSPECTION PERSONNEL SAFETY CONSIDERATIONS.
237	0033	D2	BRIDGE INSPECTION PROGRAM LACKS TYPES OF INSPECTION INCLUDING REQUIRED DETAIL.
237	0033	D3i	BRIDGE INSPECTION PROGRAM LACKS DEFINITIONS OF DEFECT LEVELS.
237	0033	D3ii	BRIDGE INSPECTION PROGRAM USING CONDITION CODES LACKS DEFINITIONS OF DEFECT LEVELS ASSOCIATED WITH CONDITION CODES USED.
237	0033	D4	BRIDGE INSPECTION PROGRAM LACKS METHOD OF DOCUMENTING INSPECTIONS INCLUDING STANDARD FORMS OR FORMATS.
237	0033	D5i	BRIDGE INSPECTION PROGRAM LACKS DEFINITION OF STRUCTURE TYPES.

237	0033	D5ii	BRIDGE INSPECTION PROGRAM LACKS COMPONENT NOMENCLATURE.
237	0033	D6	BRIDGE INSPECTION PROGRAM LACKS PROTOCOL FOR NUMBERING OR IDENTIFICATION OF SUBSTRUCTURE UNITS, SPANS, AND INDIVIDUAL COMPONENTS.
237	0051	A	RAILROAD BRIDGE ENGINEER NOT DETERMINED BY TRACK OWNER TO BE COMPETENT TO PERFORM REQUIRED FUNCTIONS.
237	0051	B	RAILROAD BRIDGE ENGINEER LACKS NECESSARY EDUCATIONAL QUALIFICATIONS.
237	0053	i	RAILROAD BRIDGE INSPECTOR NOT DETERMINED BY TRACK OWNER TO BE TECHNICALLY COMPETENT.
237	0053	ii	RAILROAD BRIDGE INSPECTOR NOT DESIGNATED TO AUTHORIZE OR RESTRICT THE OPERATION OF RAILROAD TRAFFIC OVER A BRIDGE ACCORDING TO ITS IMMEDIATE CONDITION OR STATE OF REPAIR
237	0055		RAILROAD BRIDGE SUPERVISOR NOT DETERMINED BY TRACK OWNER TO BE TECHNICALLY COMPETENT.
237	0057	i	FAILURE OF TRACK OWNER TO DESIGNATE THOSE INDIVIDUALS QUALIFIED AS RAILROAD BRIDGE ENGINEERS
237	0057	ii	FAILURE OF TRACK OWNER TO DESIGNATE THOSE INDIVIDUALS QUALIFIED AS RAILROAD BRIDGE INSPECTORS
237	0057	iii	FAILURE OF TRACK OWNER TO DESIGNATE THOSE INDIVIDUALS QUALIFIED AS RAILROAD BRIDGE SUPERVISORS
237	0057	iv	TRACK OWNER DID NOT INCLUDE BASIS FOR DESIGNATION OF INDIVIDUALS AS QUALIFIED RAILROAD BRIDGE ENGINEERS, RAILROAD BRIDGE INSPECTORS, AND RAILROAD BRIDGE SUPERVISORS.
237	0071	A	FAILURE OF TRACK OWNER TO DETERMINE SAFE LOAD CAPACITY OF BRIDGE
237	0071	B	FAILURE OF TRACK OWNER TO DOCUMENT BRIDGE LOAD CAPACITY IN BRIDGE MANAGEMENT PROGRAM, ALONG WITH METHOD USED TO DETERMINE CAPACITY.
237	0071	Ci	FAILURE OF TRACK OWNER TO USE A DESIGNATED RAILROAD BRIDGE ENGINEER TO DETERMINE BRIDGE LOAD CAPACITY.
237	0071	Cii	FAILURE OF RAILROAD BRIDGE ENGINEER TO USE APPROPRIATE ENGINEERING METHODS AND STANDARDS TO DETERMINE BRIDGE LOAD CAPACITY.
237	0071	D	USE OF NON-CONFORMING RECORDS, FAULTY DATA, OR IMPROPER METHODS FOR THE DETERMINATION OF BRIDGE LOAD CAPACITY.
237	0071	E	FAILURE OF TRACK OWNER TO PRIORITIZE BRIDGE LOAD CAPACITY DETERMINATIONS, AS ESTABLISHED BY RAILROAD BRIDGE ENGINEER.

237	0071	F	FAILURE OF TRACK OWNER TO HAVE NEW BRIDGE CAPACITY DETERMINED WHEN RAILROAD BRIDGE ENGINEER HAS FOUND CHANGE IN CONDITION THAT MIGHT ADVERSELY AFFECT ABILITY OF THE BRIDGE TO CARRY THE TRAFFIC BEING OPERATED.
237	0071	G	FAILURE TO STATE BRIDGE LOAD CAPACITY IN TERMS OF WEIGHT AND LENGTH OF EQUIPMENT.
237	0071	H	FAILURE TO COMPLY WITH RESTRICTIONS OR CONDITIONS PRESCRIBED BY A RAILROAD BRIDGE ENGINEER.
237	0073	A	FAILURE OF TRACK OWNER TO ISSUE INSTRUCTIONS FOR CONFIGURATION AND OPERATION OF TRAINS OVER BRIDGES TO PROTECT BRIDGES FROM OVER-WEIGHT OR OVER-DIMENSION LOADS.
237	0073	B	FAILURE TO EXPRESS WEIGHT INSTRUCTIONS IN TERMS OF MAXIMUM EQUIPMENT WEIGHTS, AND EITHER MINIMUM EQUIPMENT LENGTHS OR AXLE SPACING.
237	0073	C	FAILURE TO EXPRESS DIMENSIONAL INSTRUCTIONS IN TERMS OF FEET AND INCHES OF CROSS SECTION AND EQUIPMENT LENGTH, IN CONFORMANCE WITH COMMON RAILROAD INDUSTRY PRACTICE.
237	0073	D	INSTRUCTIONS ISSUED THAT EXCEED THE LOAD OR DIMENSIONAL CAPACITY OF ONE OR MORE STRUCTURES.
237	0101	Ai	FAILURE TO INSPECT EACH BRIDGE IN RAILROAD SERVICE
237	0101	Aii	FAILURE TO INSPECT EACH BRIDGE IN RAILROAD SERVICE AT LEAST ONCE PER CALENDAR YEAR.
237	0101	Aiii	FAILURE TO INSPECT EACH BRIDGE IN RAILROAD SERVICE NO MORE THAN 540 DAYS BETWEEN SUCCESSIVE INSPECTIONS.
237	0101	B	FAILURE TO INSPECT BRIDGE MORE FREQUENTLY WHEN RAILROAD BRIDGE ENGINEER HAS DETERMINED INCREASED FREQUENCY IS NECESSARY.
237	0101	C	FAILURE OF BRIDGE MANAGEMENT PROGRAM TO DEFINE REQUIREMENTS FOR SPECIAL INSPECTION OF A BRIDGE TO BE PERFORMED WHENEVER BRIDGE IS INVOLVED IN EVENT THAT MAY HAVE COMPROMISED THE INTEGRITY OF THE BRIDGE.
237	0101	D	FAILURE TO INSPECT ANY RAILROAD BRIDGE THAT HAS NOT BEEN IN RAILROAD SERVICE AND NOT INSPECTED IN PREVIOUS 540 DAYS, PRIOR TO RESUMPTION OF RAILROAD SERVICE.
237	0103	A	BRIDGE MANAGEMENT PROGRAM LACKS BRIDGE INSPECTION PROCEDURES.
237	0103	Bi	BRIDGE INSPECTION PROCEDURES NOT SPECIFIED BY A RAILROAD BRIDGE ENGINEER
237	0103	Bii	FAILURE TO INCORPORATE IN THE BRIDGE INSPECTION PROCEDURES THE METHODS, MEANS OF ACCESS, AND LEVEL OF DETAIL TO BE RECORDED.

237	0103	C	FAILURE OF THE BRIDGE INSPECTION PROCEDURES TO ENSURE THAT THE LEVEL OF DETAIL AND INSPECTION PROCEDURES ARE APPROPRIATE TO THE BRIDGE CONFIGURATION, CONDITIONS FOUND DURING PREVIOUS INSPECTIONS, THE NATURE OF RAILROAD TRAFFIC MOVED OVER THE BRIDGE, AND THE VULNERABILITY OF THE BRIDGE TO DAMAGE.
237	0103	D	BRIDGE INSPECTION PROCEDURES ARE INADEQUATE TO DETECT, REPORT AND PROTECT DETERIORATION AND DEFICIENCIES BEFORE THEY PRESENT A HAZARD TO SAFE TRAIN OPERATIONS.
237	0105	A	BRIDGE MANAGEMENT PROGRAM LACKS PROCEDURE FOR PROTECTION OF TRAIN OPERATIONS AND FOR INSPECTION OF BRIDGE DAMAGED BY NATURAL OR ACCIDENTAL EVENT.
237	0105	B	BRIDGE MANAGEMENT PROGRAM FAILS TO PROVIDE FOR DETECTION OF SCOUR OR DETERIORATION OF SUBMERGED BRIDGE COMPONENTS.
237	0107	i	BRIDGE INSPECTIONS NOT CONDUCTED UNDER THE DIRECT SUPERVISION OF A DESIGNATED RAILROAD BRIDGE INSPECTOR.
237	0107	ii	BRIDGE INSPECTION RESULTS NOT ACCURATE.
237	0107	iii	BRIDGE INSPECTION DOES NOT CONFORM TO BRIDGE MANAGEMENT PROGRAM REQUIREMENTS.
237	0109	A	FAILURE OF TRACK OWNER TO KEEP A RECORD OF EACH INSPECTION PERFORMED ON BRIDGES.
237	0109	Bi	BRIDGE INSPECTION RECORD MISSING DATE(S) OF PHYSICAL INSPECTION.
237	0109	Bii	BRIDGE INSPECTION RECORD MISSING DATE RECORD WAS CREATED.
237	0109	Biii	BRIDGE INSPECTION RECORD NOT SIGNED OR CERTIFIED.
237	0109	Biv	BRIDGE INSPECTION RECORD FALSIFIED
237	0109	C	BRIDGE MANAGEMENT PROGRAM FAILS TO SPECIFY THAT EVERY BRIDGE INSPECTION REPORT CONTAIN THE MINIMUM REQUIRED INFORMATION.
237	0109	C1	BRIDGE INSPECTION REPORT MISSING BRIDGE IDENTIFICATION.
237	0109	C2	BRIDGE INSPECTION REPORT MISSING DATE PHYSICAL INSPECTION COMPLETED.
237	0109	C3i	BRIDGE INSPECTION REPORT MISSING INSPECTOR'S IDENTIFICATION.
237	0109	C3ii	BRIDGE INSPECTION REPORT MISSING INSPECTOR'S WRITTEN OR ELECTRONIC SIGNATURE.
237	0109	C4	BRIDGE INSPECTION REPORT LACKS INDICATION OF TYPE OF INSPECTION PERFORMED.
237	0109	C5i	BRIDGE INSPECTION REPORT LACKS METHOD TO INDICATE A NEED FOR REVIEW BY RAILROAD BRIDGE ENGINEER.

237	0109	C5ii	BRIDGE INSPECTION REPORT LACKS INDICATION OF NEED FOR REVIEW BY RAILROAD BRIDGE ENGINEER, WHERE APPROPRIATE.
237	0109	C5iii	BRIDGE INSPECTION REPORT LACKS METHOD OF REPORTING RESTRICTIONS PLACED AT TIME OF INSPECTION
237	0109	C5iv	BRIDGE INSPECTION REPORT LACKS INDICATION OF RESTRICTIONS PLACED AT TIME OF INSPECTION, WHERE APPROPRIATE.
237	0109	C6i	BRIDGE INSPECTION REPORT MISSING CONDITION OF COMPONENT INSPECTED.
237	0109	C6ii	BRIDGE INSPECTION REPORT LACKS NARRATIVE DESCRIPTION NECESSARY TO CORRECTLY INTERPRET REPORT.
237	0109	C7	BRIDGE INSPECTION REPORT COVERING LESS THAN ENTIRE BRIDGE LACKS INDICATION OF PORTIONS INSPECTED.
237	0109	Di	FAILURE TO PLACE INITIAL BRIDGE INSPECTION REPORT IN LOCATION DESIGNATED IN BRIDGE MANAGEMENT PROGRAM WITHIN 30 CALENDAR DAYS OF COMPLETION OF THE BRIDGE INSPECTION.
237	0109	Dii	INITIAL BRIDGE INSPECTION REPORT LACKS REQUIRED INFORMATION.
237	0109	Ei	FAILURE TO PLACE FINAL BRIDGE INSPECTION REPORT IN LOCATION DESIGNATED IN BRIDGE MANAGEMENT PROGRAM WITHIN 120 DAYS OF COMPLETION OF THE BRIDGE INSPECTION.
237	0109	Eii	FINAL BRIDGE INSPECTION REPORT LACKS REQUIRED INFORMATION.
237	0109	Fi	FAILURE TO SPECIFY RETENTION PERIOD OR LOCATION FOR BRIDGE INSPECTION RECORDS.
237	0109	Fii	FAILURE TO RETAIN BRIDGE INSPECTION RECORDS AS REQUIRED.
237	0109	G	FAILURE TO PROMPTLY REPORT A DEFICIENT CONDITION ON A BRIDGE THAT AFFECTS THE IMMEDIATE SAFETY OF TRAIN OPERATIONS TO THE PERSON WHO CONTROLS OPERATION OF TRAINS ON THE BRIDGE.
237	0111	A	FAILURE TO REVIEW BRIDGE INSPECTION REPORTS TO DETERMINE WHETHER INSPECTIONS HAVE BEEN PERFORMED IN ACCORDANCE WITH PRESCRIBED SCHEDULE AND SPECIFIED PROCEDURES.
237	0111	B	FAILURE TO REVIEW BRIDGE INSPECTION REPORTS TO EVALUATE WHETHER ANY ITEMS ON THE BRIDGE INSPECTION REPORT REPRESENT A PRESENT OR POTENTIAL HAZARD TO SAFETY.
237	0111	C	FAILURE TO REVIEW BRIDGE INSPECTION REPORTS TO DETERMINE WHETHER ANY MODIFICATIONS ARE NEEDED TO THE INSPECTION PROCEDURES OR FREQUENCY OF INSPECTIONS FOR THAT BRIDGE.
237	0111	D	FAILURE TO REVIEW BRIDGE INSPECTION REPORTS TO DETERMINE WHETHER ANY REPAIRS OR MODIFICATIONS REQUIRED TO MAINTAIN STRUCTURAL INTEGRITY SHOULD BE SCHEDULED.

237	0111	E	FAILURE TO REVIEW BRIDGE INSPECTION REPORTS TO DETERMINE WHETHER HIGHER-LEVEL REVIEW IS NEEDED.
237	0131		BRIDGE REPAIR OR MODIFICATION NOT DESIGNED BY RAILROAD BRIDGE ENGINEER, AS REQUIRED.
237	0133		BRIDGE REPAIR OR MODIFICATIONS NOT PERFORMED UNDER IMMEDIATE SUPERVISION OF A RAILROAD BRIDGE SUPERVISOR, AS REQUIRED.
237	0151		BRIDGE MANAGEMENT PROGRAM LACKS PROVISIONS FOR AUDITING THE PROGRAM, INCLUDING VALIDITY OF BRIDGE INSPECTION REPORTS, BRIDGE INVENTORY DATA, AND THE CORRECT APPLICATION OF MOVEMENT RESTRICTIONS.
237	0153	Ai	BRIDGE MANAGEMENT PROGRAM LACKS PROVISIONS FOR AN INTERNAL AUDIT TO DETERMINE WHETHER THE INSPECTION PROVISIONS OF THE PROGRAM ARE BEING FOLLOWED.
237	0153	Aii	BRIDGE MANAGEMENT PROGRAM LACKS PROVISIONS FOR AN INTERNAL AUDIT TO DETERMINE WHETHER THE PROGRAM IS EFFECTIVELY PROVIDING FOR THE CONTINUED SAFETY OF THE SUBJECT BRIDGES.
237	0153	B	FAILURE TO EVALUATE A REPRESENTATIVE SAMPLING OF BRIDGE INSPECTION REPORTS FOR ACCURACY AT THE BRIDGES NOTED.
237	0155		FAILURE TO MAKE PROGRAM DOCUMENTS AND RECORDS AVAILABLE FOR INSPECTION AND REPRODUCTION BY FEDERAL RAILROAD ADMINISTRATION.
237	0155	A	FAILURE TO COMPLY WITH ELECTRONIC RECORDKEEPING REQUIREMENTS.
237	0155	B	FAILURE TO COMPLY WITH SYSTEM SECURITY REQUIREMENTS.

Note – Defect code descriptions are not regulatory language. They are analytical instruments only, and are subject to change as needed. Activity and source codes are analytical instruments only for use with FRA's Railroad Inspection System for the PC (RISPC) software program. These codes are specific to the bridges and structures discipline only and use additional codes for other activities as appropriate.