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Subj: Tourist Railway Assoc. - FRA Bridge Safety Standards

Robert,

Below is an article I wrote for the ASLRRA that the members of the Tourist Railway Association may find helpful so feel free to send it on. Mike Ramsey suggested I send it to you.

Some members already are required to have bridge safety management programs but the rest fall under the upcoming deadline. The regulations apply to all railroads, with a track gage of 2 feet or more, that have a track supported by a bridge, turntable, etc.

If you have any questions, please contact me.

Thanks,

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Bridge Management Programs – Time is Short

By Roger Boraas, P.E.

The remaining deadline of September 13, 2012 for adopting a Bridge Management Program (BMP) as required by the FRA Bridge Safety Standards (49CFR Part 237) is fast approaching. This deadline applies to “all other track owners subject to this part”, primarily Class III freight railroads, tourist railroads with ten or less passenger trains per week (including narrow gage and museums) and industries where non-plant railroads operate over railroad bridges. The previous deadlines applied to Class I and Class II railroads, commuter railroads and any other standard gage railroad operating more than ten scheduled passenger trains per week.

[R.T. Opal note – March 14, 2011 deadline for trackage with “more than 10 passenger trains per week” applied only to general system trackage. Deadline for non-general system tourist roads was September 13, 2012, regardless of number of trains operated, See Sec 237.31(b) and (d)].

To help short lines prepare for the upcoming compliance deadline, the ASLRRA held three seminars earlier this year that covered the requirements of the regulations, the expectations of the FRA regarding compliance with the regulations and provided some example language for BMPs. As discussed in the seminars, the ASLRRA document on bridge management, which the ASLRRA issued prior to the final 237 rule, provides a starting point but does not cover all of the rule requirements. For those that missed the seminars, here is a brief overview of the requirements.

Bridge Safety Standards Requirements

The Bridge Safety Standards requires all track owners covered by the regulations to adopt a bridge management program but has other requirements as well. Your BMP document should address all of the regulatory requirements in the Bridge Safety Standards such as:

1. An accurate inventory of all railroad bridges
2. A determination and record of the safe load capacity of each bridge
3. Proper instructions to operating personnel regarding restrictions on equipment weight and dimensions
4. A provision to obtain/maintain bridge documents such as records of design, inspection, and repair or maintenance for all bridges

5. A bridge inspection program
6. A record of individuals designated as Railroad Bridge Engineers (RBE), Inspectors(RBI) and/or Supervisors (RBS), along with the basis for the designation
7. Design and repair of railroad bridges by RBEs and RBSs
8. A provision for internal audits of compliance with the BMP requirements, especially the bridge inspection program
9. Electronic recordkeeping – provisions for employee training and the security and accuracy of records if an electronic system is used

Below are brief discussions of each of these items.

1. Bridge Inventory

Section 237.33(a) requires that the track owner have an accurate inventory of its bridges. The inventory is typically a list of the structures covered by the regulation that contains the minimum required information about each structure such as a unique identifier, location, configuration, type of construction, number of spans and span lengths and any other information necessary for bridge safety management. Additional information that can be helpful includes overall bridge length, height, feature crossed, walkways, dates of construction, etc. This list provides a handy, quick reference of the number and type of bridges on the railroad.

2. Safe Load Capacity

Section 237.33(b) requires that the track owner have a record of the safe load capacity of each bridge. This is necessary so the track owner can determine the type and weight of rail equipment that can safely pass over any bridge. Per 237.71, the BMP should specify the method and load system used to make these determinations. Typically, the methods used are in the *AREMA Manual for Railway Engineering* chapters on steel, concrete and timber structures (Ch. 15, 8 & 7) which utilize the Cooper E load system. However, other methods or load systems may be acceptable. The record of the safe load capacity for each bridge must include the name of the designated Railroad Bridge Engineer that made the determination along with the methodology used and should include the basis for the determination, such as design drawings, field measurements, etc.

Section 237.71(e) allows a period of five year from the required date of adoption of a BMP to complete the determination for all bridges that do not currently have a determined safe load capacity. For track

owners subject to the September 13, 2012 deadline for adoption of a BMP, you then have until September 13, 2017. However, you are encouraged to do this sooner rather than later to minimize the risk of a bridge failure due to overload. If bridges do not have a determined safe load capacity, a schedule for evaluation should be included with the BMP based on relative priority of the bridges.

3. Instructions to Operating Personnel

Section 237.73 requires that the track owner issue instruction to the personnel responsible for the configuration and operation of trains. Two levels of instruction cover weight or dimensional loads. One is the instructions regarding regular daily traffic. The second covers unusual loads that exceed the weight and/or dimension of regular daily traffic. Instructions regarding regular daily (unrestricted) traffic are typically found in the employee timetable but may be covered by a general order or general bulletin. These instructions show the configuration of equipment (minimum length, axle spacing, etc.), along with the maximum weight and/or dimensions that may be moved on the railroad without any special review or handling restrictions.

For loads that do not fall within the weight limits for unrestricted movement, a review by an RBE must occur. If accepted for movement, the RBE must issue special instructions that incorporate the equipment configuration (minimum length, axle spacing, etc.) and may include speed restrictions, passing restrictions or other specific handling procedures. The BMP should cover how this process works on your railroad.

4. Provision to Obtain/Maintain Bridge Records

Section 237.33(c) requires that the BMP must have language that provides for documenting and retaining reports for all inspections and repairs/modifications to bridges. It must also include a provision to obtain and retain design documents, if available.

Section 237.109(f) requires that the track owner keep bridge inspection records for a minimum of two years, with one exception. Many railroads keep them beyond that time to provide a history of deterioration of defects. The exception pertains to underwater inspections. You must keep underwater inspection records for no less than two years, or until the next similar inspection, whichever is later. Generally, railroads keep all design, repair and modification records for the life of the bridge. The regulation also requires that the BMP specify the location where the inspection records are stored. Typically, this is the address of the physical location where the records are kept and/or are made available to the FRA for review.

5. Bridge Inspection Program

The Bridge Inspection Program (BIP) is the first line of defense against potential structural failure and often is considered the keystone of good bridge management. Regulations covering bridge inspection are found in sections 237.33(d) and 237.101 through 111. The BMP contains provisions regarding the requirements of the BIP. A BIP consists of many items such as:

- a. Inspector Safety
- b. Structure Nomenclature
- c. Component Identification Protocol
- d. Defect Identification/ Condition Codes
- e. Types of Inspections / Inspection Procedures
- f. Inspection Frequency
- g. Conduct of Inspections
- h. Inspection Documentation Format
- i. Inspection Review

a. Inspector Safety

The BIP must contain provisions pertaining to the safety of the inspector in the performance of his/her duties. Typically this includes references to Roadway Worker Protection/On Track Safety and Bridge Worker Safety requirements, general safety requirements (e.g. use of personal protective equipment) and any site specific conditions that may be encountered.

b. Structure Nomenclature

What types of structures do you have? What do you call the components of that structure? Do you use abbreviations? The BIP must spell out this information as used on your property.

c. Component Identification Protocol

How do you identify where a defect or other condition is on a bridge? Typically, it involves numbering or lettering of components in some orderly way. Often this involves counting components with spacing parallel to the track in the direction of increasing mileposts and components with spacing perpendicular to the track from left to right. The BIP must spell out what system you are using on your property.

d. Defect Identification/ Condition Codes

Deterioration and damage of bridge components comes in many forms. The BIP must spell out the types and levels of deterioration or damage that the inspector is to look for and document. Some railroads use codes to describe specific types and severity of defects. Other railroads use codes to provide information as to the overall condition of a component. Whatever method is used, the BIP must spell out sufficient definition or description of any codes used to ensure consistency among different inspectors.

e. Types of Inspections / Inspection Procedures

The BIP must include defined types of inspections along with specified procedures to perform those types of inspections on the types of bridges on the property. At a minimum, there are two types of inspections. One is a general inspection covering the entire bridge. The second is a special inspection after a report of possible damage, which may or may not cover the entire bridge. However, other types of defined inspections can be useful, such as an interim inspection. This may include only specific portions of a bridge with deterioration that needs more frequent monitoring. The procedures to perform these types of inspections need to consider the type of bridge being inspected. Procedures spell out how the inspector is to perform the inspection and what the inspector is looking for.

f. Inspection Frequency

The BIP must include the frequency of inspection for the types of inspection used. Typically, bridges get a general inspection once per year. Section 237.101(a) requires an annual inspection with no more than 540 days between inspections. Performance of other inspections may be on a more frequent or less frequent schedule. Some inspections may be only as needed (e.g. emergency inspections or inspections of bridges that have been out of service).

g. Conduct of Inspections

Section 237.107 requires that bridge inspections be conducted under the direct supervision of a designated RBI. The BIP should have a provision verifying this as policy on your property. The use of the term “direct” allows other personnel to assist the designated RBI, however, the designated RBI is responsible for the accuracy of the results and the conformity of the inspection to the BMP/BIP requirements.

h. Inspection Documentation Format

The BIP should include an example of the format or formats used for the bridge inspection report. The report format must address the requirements found in Sections 237.109(b) and (c).

i. Inspection Review

An inspection report created does no good if no one looks at it. The regulations require review of bridge inspection records. Typically, a bridge manager and/or an RBE perform the review. The BIP should include provisions covering the review process used on your property.

6. Designation of Railroad Bridge Engineers, Railroad Bridge Inspectors and Railroad Bridge Supervisors

The regulation (237.57) requires that each track owner designate individuals as qualified in one or more of the three categories shown. Remember, the FRA considers these as job categories and are not necessarily job titles. While the regulations specify minimum qualifications for a designation in these categories, it is up to the track owner to make the determination if a person is qualified and to designate that person in the proper category. Designation of an individual may be in one or more of the categories. The designation must include a basis for the designation (e.g. “ten years of experience in railroad bridge inspection”). These designations include authorization to allow or restrict operations of train traffic over a bridge based on its condition. Typically, the BMP will contain a list or spreadsheet showing the individuals’ name, the designation category or categories and the basis for the designation (experience, education, etc.).

7. Design/Repair of Bridges

Design – The regulation (237.131) requires that a designated RBE design any repair or modification of a bridge that materially modifies the capacity of the bridge or the stresses in primary load carrying members. If a railroad uses common standards for these types of repairs, an RBE must issue or approve the use of the common standard. The BMP should include provisions to cover these items.

Repairs – The regulation (237.133) requires repairs that require design by an RBE be performed under the immediate supervision of a designated RBS. “Immediate” means that the RBS is on site to ensure that the repairs are accomplished in accordance with the design and any specified procedures and /or traffic restrictions. The BMP should include a provision to cover this item.

8. Audits

Sections 237.151 & 153 require that the track owner conduct internal audits of the Bridge Management Program in general and the Bridge Inspection Program in particular. The BMP should spell out the frequency and the steps taken to perform the audits. An example of a general audit should include a field verification of bridge inventory information, a review and update of BMP provisions, and a review or verification that any high-wide or heavy load movements were performed in accordance with issued instructions. An audit of the Bridge Inspection Program should include field verification of the accuracy of the reports by using a sample number of bridges. The track owner should keep a record of each audit.

9. Documents and Electronic Records

If the track owner uses an electronic data base for creation and storage of bridge records, the regulation (237.155) requires that , among other things, the system be secure from unauthorized access, that the documents kept therein are accurate and that employees be trained on the proper use of the system. The BMP should contain wording pertaining to these items. The BMP should also contain wording that verifies that program records and documents are available for inspection and reproduction by the FRA.

In Summary

In order to put together a good bridge management program, remember these four steps: read, think, organize and write. Read the regulations. Think about what you are doing or need / want to do on your property. Organize the way you want the document to look and read. Write the provisions of the document. Remember, the life span of the average bridge is longer than the career of the average bridge manager so this is also a chance to document how and why things are being done now, which will help the next person that becomes responsible for those bridges.

I hope that all of you have already begun, if not completed, the process to write and adopt a Bridge Management Program. If you have not yet begun, the Bridge Tracks article issued in March 2011 provides additional information on getting started on a BMP. In addition, your friendly FRA Bridge Safety Specialist can provide guidance on the regulatory requirements. Remember, the FRA Bridge Safety Standards are “minimum” requirements and proper management of bridge safety may necessitate that

your written program include other measures such as a higher frequency of inspections or inclusion of additional structures. In addition, you may want to include additional non-regulatory policies, such as one on the design of new bridges.

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