Recommendation Report

Wednesday, August 01, 2007

LOG:h-0635*

Log Number H-0635A

Issue Date 9/9/2004

Webbers Falls OK **5/26/2002**

About 7:45 a.m., on May 26, 2002, the towboat Robert Y. Love, pushing two empty asphalt tank barges, was traveling northbound on the McClellan-Kerr Arkansas River Navigation System (M-KARNS) near Webbers Falls, Oklahoma. As the tow approached the Interstate 40 highway bridge (I-40 bridge) at mile 360.3, it veered off course and rammed a pier 201 feet west of (outside) the navigation channel. The impact collapsed a 503-foot section of the bridge, which fell into the river and onto the barges below. According to witnesses, highway traffic continued to drive into the void in the bridge created by the collapsed spans. When traffic stopped, eight passenger vehicles and three truck tractor-semitrailer combinations had fallen into the river or onto the collapsed portions of the bridge. The accident resulted in 14 fatalities and 5 injuries and caused an estimated $30.1 million in damage to the bridge, including the operation of detours, and $276,000 in damage to the barges.

Recommendation # H-04-029

Overall Status
OAA

Priority

The National Transportation Safety Board recommends that the Federal Highway Administration: Revise your sufficiency rating system, which prioritizes bridges for rehabilitation and replacement, to include the probability of extreme events, such as vessel impact.

FHWA	Open - Acceptable Response

12/13/2004 Addressee

Letter Mail Controlled 12/21/2004 9:14:22 AM MC# 2040727 The FHWA agrees that mitigation activities are important to ensure safety during extreme events; however, revision of the sufficiency rating formula does not ensure priority or selection of such activities in State-level program development. Modification of the sufficiency rating formula would simply mean that the eligibility of a few bridges might change.

A more proactive and effective approach that would provide a better overall outcome is to urge bridge owners to conduct vessel impact vulnerability assessments on their bridges over navigable waterways. The assessments can be based on the American Association of State Highway and Transportation Officials' (AASHTO) Guide Specification and Commentary for Vessel Collision Design of Highway Bridges. We will work with the bridge owners to set a time period of 3 to 5 years for completion of this assessment and clarify the eligibility of retrofit measures. We will work with AASHTO to continue the assessment of vulnerabilities to all extreme events, identification of associated needs, and consideration of these needs in prioritizing and selecting work activities. We will also continue to seek maximum flexibility in the Highway Bridge Replacement and Rehabilitation Program to allow funding for extreme event protection and damage prevention measures.

The FHWA will work aggressively with the State departments of transportation and the research community to meet the objectives of the recommendations. We appreciate the NTSB's efforts to address potential safety concerns. For additional information concerning our actions to address your recommendations, please contact M. Myint Lwin in the Office of Bridge Technology (202) 366-4589.

4/12/2005 NTSB

The Safety Board recognizes that modification of the sufficiency rating formula would mean that the eligibility of only a few bridges might change, but that is precisely why Safety Recommendation H-04-29 was issued-to change the eligibility of those few bridges that are vulnerable. In the Webbers Falls report, the Board concluded that including the relative risk of extreme events in the bridge sufficiency ratings and in the priority for rehabilitation and replacement would help provide a more accurate assessment of a bridge's risk of collapse and loss of life.

The FHWA has advised the Safety Board that it will urge the owners of bridges over navigable waters to conduct vessel impact vulnerability assessments on their bridges based on the American Association of State Highway and Transportation Officials' (AASHTO) Guide Specification and Commentary for Vessel Collision Design of Highway Bridges. Specifically, the FHWA will work with bridge owners on the assessments and clarify the eligibility of retrofit measures. Further, the FHWA reports that it will work with AASHTO to continue the assessment of vulnerabilities to all extreme events, identification of associated needs, and consideration of these needs in prioritizing and selecting work activities, and will continue to seek maximum flexibility in the highway bridge replacement and rehabilitation program to allow funding for extreme event protection and damage prevention measures. Because the FHWA is taking some positive action on this issue, Safety Recommendation H-04-29 is currently classified "Open--Acceptable Response." However, the Board points out that this recommendation calls for a revision to the sufficiency rating system, and if that change to the rating system is not made, we may have no alternative but to classify this recommendation "Closed--Unacceptable Action."

Recommendation Report

Wednesday, August 01, 2007

LOG:h-0635*

Recommendation # H-04-030

Overall Status
OAA

Priority

The National Transportation Safety Board recommends that the Federal Highway Administration: Develop an effective motorist warning system to stop motor vehicle traffic in the event of a partial or total bridge collapse.

FHWA	Open - Acceptable Response

12/13/2004 Addressee

Letter Mail Controlled 12/21/2004 9:14:22 AM MC# 2040727 Based on the vulnerability assessments recommended above, all susceptible bridges will be prioritized in accordance with the level of vulnerability. The priority will help the States identify specific bridges for protecting structures from collapse, e.g., when a boat impacts its pier(s). In the case of new bridge construction, the bridge pier should be either designed using Vessel Collision Guide Specifications or moved out of the navigational channel, without the need for installation of a motorist warning system.
For a vulnerable existing bridge, the first choice should be protecting piers with modem fender systems. However, these fender systems may be cost-prohibitive considering available resources. In that situation, motorist warning system would be appropriate to protect the traveling public.
There exists only limited experience with design and installation of motorist warning systems in the United States and abroad. The Florida Department of Transportation has already characterized its experience with the warning system on the Sunshine Skyway Bridge in Florida as being unreliable. However, the Texas Department of Transportation (TxDOT) staff indicated that regularly conducted routine performance tests designed to check motorist warning system reliability on the Queen Isabella Memorial Bridge in Texas shows satisfactory performance since the installation of the entire system. This system has not been through any actual collapse. There are no standard designs, procedures and specifications available at this time for installation of motorist warning systems. For example, the Queen Isabella Memorial Bridge has a unique warning system custom-tailored and installed using available subsystems to develop a complete system. This will serve as a model for an improved system. We will work with TxDOT to study and improve on the system performance and reliability to set the standards for future systems. We can start this effort immediately.
Additionally, we propose a comprehensive research program to develop a motorist warning system, which can be easily installed, maintained and be reliable. We will work with TxDOT and the AASHTO Subcommittee on Bridges and Structures to immediately develop a research problem statement (WS) to perform the needed research. According to TxDOT officials, the fiber optic cable installation system could be simpler than the one they used. Also, an important component of the motorist warning system, Programmable Logic Controller could be versatile enough without the need for comprehensive training in its programming and maintenance. We will prepare a RPS to include all of TxDOT's and others' ideas within 3 months and submit it to the AASHTO Subcommittee for adoption during the June 2005 annual meeting. We expect the research to be completed in 3-4 years. This research could be funded through the National Cooperative Highway Research Program.
The FHWA will work aggressively with the State departments of transportation and the research community to meet the objectives of the recommendations. We appreciate the NTSB's efforts to address potential safety concerns. For additional information concerning our actions to address your recommendations, please contact M. Myint Lwin in the Office of Bridge Technology (202) 366-4589.

4/12/2005 NTSB

The Safety Board notes that the FHWA will research what the Texas and Florida Departments of Transportation are using for motorist warning systems in their jurisdictions, and will work with the AASHTO Subcommittee on Bridges and Structures to develop a reliable national system, appropriate for various bridge designs and traffic conditions, that can be easily installed and maintained.
Because the FHWA is taking positive steps towards the recommended action, Safety Recommendation H-04-30 is classified "Open--Acceptable Response."

Recommendation Report

Wednesday, August 01, 2007

LOG:h-0635*

Log Number H-0635

Issue Date 9/9/2004 **Webbers Falls OK** **5/26/2002**

About 7:45 a.m., on May 26, 2002, the towboat Robert Y. Love, pushing two empty asphalt tank barges, was traveling northbound on the McClellan-Kerr Arkansas River Navigation System (M-KARNS) near Webbers Falls, Oklahoma. As the tow approached the I-40 bridge at mile 360.3, it veered off course and rammed a pier 201 feet west of (outside) the navigation channel. The impact collapsed a 503-foot section of the bridge, which fell into the river and onto the barges below. According to witnesses, highway traffic continued to drive into the void in the bridge created by the collapsed spans. When traffic stopped, eight passenger vehicles and three truck tractor-semitrailer combinations had fallen into the river or onto the collapsed portions of the bridge. The accident resulted in 14 fatalities and 5 injuries and caused an estimated $30.1 million in damage to the bridge, including the operation of detours, and $276,000 in damage to the barges.

Recommendation # H-04-031

Overall Status
OAAR

Priority

The National Transportation Safety Board makes the following recommendation to the American Association of State Highway and Transportation Officials: Once an effective motorist warning system has been developed, provide guidance to the States on its use.

AMERICAN ASSOCIATION OF STATE HIGHWAY Open Acceptable Alternate Response

3/31/2006	Addressee	Letter Mail Controlled 4/3/2006 10:48:34 AM MC# 2060172:Currently there is no effective motorist warning system available, thus AASHTO can not lend any guidance on this matter. However, a research project has been proposed to the AASHTO Standing Committee on Research, NCHRP 2007-D-04, which is a study into the bridge collapse detection and warning system. Attached is the NCHRP Research Problem Statement, which details the project and its objectives. Unfortunately, this project was not selected to move forward during the SCOR meeting in mid March, 2006, due to insufficient funds. Until an effective motorist warning system has been developed, AASHTO will continue to work on this recommendation.
7/23/2007	NTSB	A research project (NCHRP 2007-D-04) was proposed to the AASHTO Standing Committee on Research (SCOR) to develop a bridge collapse detection and warning system; however, AASHTO indicates that this project was not selected to move forward during the mid-March 2006 SCOR meeting due to insufficient funds. The Safety Board understands that although the SCOR evaluation panel ranked this project as the 6th highest priority of 33 projects presented for research funding, the panel believes that emphasis should be placed on the prevention of navigation impacts or structure collapse. In a companion recommendation from the Webbers Falls accident, the Safety Board recommended that the FHWA develop an effective motorist warning system to stop motor vehicle traffic in the event of a partial or total bridge collapse. Safety Board staff has learned that, because AASHTO funding has not been approved, the FHWA is seeking other avenues, such as pooling funds with State departments of transportation, to fund research to address this project. The Board continues to believe that the development of reliable long-term sensing technology is critical not only in protecting the motoring public on bridges vulnerable to collapse from vessel impact but also from such other circumstances as seismic events, scour, and terrorist attacks. The Board, therefore, encourages AASHTO to reconsider its position on funding the proposed research project. The Safety Board notes that because there is currently no effective motorist warning system available, AASHTO is not able to provide any guidance to the States, but the organization is still pursuing various avenues to address this issue. Accordingly, pending the development of an effective motorist warning system for bridges for which AASHTO can provide guidance on its use to the States, Safety Recommendation H-04-31 is classified Open Acceptable Alternate Response.

Total Number of Recommendations for Recommendation Report: 3

Selection for Report:

LOG:h-0635*