Transportation Safety Board of Canada
Bureau de la sécurité des transports du Canada

REASSESSMENT OF THE RESPONSE TO RAIL RECOMMENDATION R10-01

Tank car stub sill failures

Background

On 14 January 2009, at approximately 0330 Central Standard Time, Canadian National freight train M-30451-11 was proceeding eastward at 4 mph when it experienced an undesired emergency brake application and came to a stop at Mile 238.30 of the Redditt Subdivision near Dugald, Manitoba. Subsequent inspection revealed that the train had separated and the A-end stub sill of dangerous goods tank car UTLX 37605, loaded with approximately 51 500 pounds of propylene (UN 1075), had severed and pulled out of the car. There was no release of product, no derailment, no track damage and no injuries.

The Association of American Railroads (AAR) requires railways to complete and submit standard reports for various mechanical component failures, including axles (MD-12), wheels (MD-115), roller bearings (MD-11), truck sides and bolsters. These reports are regularly evaluated by the AAR. In some cases, the evaluation has resulted in the issuance of AAR circulars for the recall or monitoring of potentially defective components.

With regards to tank car stub sills, car owners ensure that a SS3 Form is completed for each tank car stub sill inspection. Similarly, an R-2 Form is completed for repairs to tank car stub sills resulting from non-accidental buckles, corrosion, and cracks. While these reports are submitted to the AAR, they are not reviewed to identify emerging trends in stub sill failures. Furthermore, older tank cars are often scrapped after a stub sill failure (that is, badly cracked or broken stub sill) due to the associated cost of repair. In these circumstances, no R-2 Form is completed because the stub sill is not repaired. Consequently, information on stub sill failures is not always consistently recorded, nor is it analyzed for safety defects.

Within the North American tank car fleet of approximately 325 000 cars, about 41 000 of these (13 per cent) are equipped with UTLZBN stub sills. Approximately 35 000 of the tank cars equipped with UTLZBN stub sills are in dangerous goods service. In Canada, between January 2004 and June 2009, 58 tank cars were bad ordered for cracked stub sills (50) or broken stub sills (8). Although tank cars equipped with UTLZBN design stub sills only represent 13 per cent of the tank car population, for the 5.5-year period starting January 2004, these tank cars accounted for 34 per cent of the cracked stub sills (17 of 50) and 100 per cent of the broken stub sills (8 of 8). In many of these cases, Transport Canada (TC) had no information, or limited information, regarding these failures because there is no requirement to report them.

Unlike axles and wheels, there is no requirement for a railway to report a cracked or broken tank car stub sill to the AAR. In Canada, there is no regulatory requirement to report such failures under the *Railway Freight Car Inspection and Safety Rules* or, for tank cars carrying

dangerous goods, under the *Transportation of Dangerous Goods Act*. Due to this situation, inconsistent reporting of stub sill failures has occurred, likely resulting in the under-representation of these failures. Without an industry or regulatory protocol to document tank car stub sill failures, a stub sill design that is susceptible to failure may not be identified in a timely manner. Therefore, the Board recommends that:

> The Department of Transport, in conjunction with the railway industry and other North American regulators, establish a protocol for reporting and analyzing tank car stub sill failures so that unsafe cars are repaired or removed from service.
>
> R10-01

TC's response to R10-01 (December 2010)

Transport Canada (TC) accepts the intent of the recommendation R10-01. TC recognizes the importance of having appropriate data through effective reporting systems to protect public safety in the transport of dangerous goods.

Following this accident, TC has analyzed the current data on tank car stub sill failures to identify trends and anomalies, and will continue this work as more information becomes available. In January 2010, TC initiated an inspection program with its federal inspectors to conduct inspections of stub sills on rail tank cars.

While a North America system exists for tracking stub sill repairs, TC is committed to working with the industry and other North America regulators to take appropriate steps to improve data collection and reporting requirements. TC has ongoing meetings with the Federal Railroad Administration (FRA) and the American Association of Railroads to investigate both the particulars of this accident and the associated data collection concerns. As a consequence, TC and the FRA are considering implementing additional interim reporting requirements for industry.

Over the next 3-4 years, TC will be conducting a full review and update of reporting requirements in Part 8 of the *Transportation of Dangerous Goods Regulations*. This review will consider any interim measures adopted, and assess the need for further regulatory changes to improve reporting of stub sill failures.

Additional TC response to R10-01 (February 2011)

In order to specifically address recommendations (R10–01), senior representatives from Transport Canada, Transportation of Dangerous Goods Directorate and the US Federal Railroad Administration (FRA) co-chaired a meeting with key senior officials from the Association of American Railroads (AAR) and the Railway Supply Institute (RSI) in Washington on 17 December 2010. The following is a summary of actions taken based on discussions from this meeting:

- The AAR agreed for its members to review the current billing and deprecated value (DV) system in order to identify stub sill failures and to assure that the information is reported and made available to the car owners. Representatives from RSI and AAR are currently discussing implementation details.
- An improved version of the stub sill inspection database is in its final development stage (SS3/TCID: Tank Car Inspection Database). It is expected that the beta version will be released in spring 2011. A meeting is planned for February 17, 2011 with tank car owners, AAR, RSI, TDG and FRA to review the details of its capabilities and assure it is satisfactory to meet the needs.
- All parties agreed to look into identifying gaps in the existing stub sill inspection and reporting system. TDG will participate in the Feb. 17, 2011 meeting to assure its current concerns in this regard are addressed with the new TCID.
- The possibility of modifying the AAR field interchange rules to prohibit repair of fractures to structural members of stub sills was discussed. It appears that consensus on this matter may be difficult to obtain within the AAR membership. TDG has drafted language in the upcoming TC standard (TPI4877) to require stub sill inspections and limit certain stub sill repairs to registered tank car facilities. Simultaneously, the TDG Directorate is in the process of developing an amendment package to Part 8 of the TDG Regulations, which will recommend mandatory regulatory provisions for reporting to assure that tank car stub sill failures are reportable. A regulatory working group has been established and it is expected that the regulatory policy will be completed within the next year and recommendations prepared to submit a regulatory package for consideration in the Canada Gazette Part I.
- The AAR, FRA and TDG will be responsible to provide appropriate oversight when the TCID database is implemented. The content of the full TCID database is expected to be available to the AAR, FRA and TDG.
- Stub sill designations in the database are to be reviewed to assure they are appropriate and represent the current status of the tank car, particularly those tank cars whose stub sill designations have been modified. This topic will be discussed during the February 17, 2011 meeting.
- It is expected that the reporting of stub sill inspections in the TCID will be made mandatory at the time of its implementation.

TDG and Rail Safety inspectors were asked to pay close attention to the tank car of the type identified in the TSB report during their normal inspection work. A list of the affected tank car reporting marks and numbers was made available to them as well as a guideline to help identify and document stub sill defects consistent with the concerns outlined by the report. TC will also continue to work in close cooperation with FRA and Union Tank Car Company to analyze the stub sill design and the implementation of appropriate repair and modification procedures.

Board assessment of response to R10-01 (February 2011)

Transport Canada, in conjunction with the railway industry and other North American regulators are working to establish requirements for the reporting and analyzing of tank car stub sill failures. A number of initiatives are under way that will likely lead to resolving the deficiency, therefore, the Board assesses the response to this recommendation as **Satisfactory Intent.**

Additional TC response to R10-01 (October 2011)

The requirement for mandatory reporting of stub sill failures is currently under review with the Railway Association of Canada as part of ongoing discussions to revise the Railway Freight Car Inspection and Safety Rules. The new TCID database is expected to be implemented during 2012.

Board assessment of response to R10-01 (February 2012)

TC and the RAC are working to revise the Railway Freight Car Inspection and Safety Rules to create a mandatory protocol for reporting tank car stub sill failures so that unsafe cars are repaired or removed from service. However, for the present, the action has not been sufficiently advanced to reduce the risks of the deficiency. Therefore, the Board assesses the response to Recommendation R10-01 to remain **Satisfactory Intent.**

Additional TC response to R10-01 (January 2013)

Damage to a stub sill attachment with a crack greater than 6 inches is a new safety defect under the new Railway Freight Car Inspection and Safety Rules (RFCSR) approved in December 2012. The new RFCSR come into effect in February 2013.

A tank car inspection database (TCID) has been developed. The TCID will be the repository of maintenance, repairs and reported damage on stub sills. Some fine tuning for the report batching is being finalized.

Board assessment of response to R10-01 (07 March 2013)

The Railway Freight Car Inspection and Safety Rules mandate the reporting of tank car stub sill damage to ensure that unsafe cars are repaired or removed from service. With a system in place to track the defects and repairs, the risk of tank cars with stub sill failures not being repaired or removed from service has been substantially reduced. Therefore, the Board assesses the response to Recommendation R10-01 to be **Fully Satisfactory.**

Next TSB action

This deficiency file is assigned **Closed** status.