REASSESSMENT OF THE RESPONSE TO RAIL SAFETY RECOMMENDATION R07-02 - R05E0059

RAIL TESTING, INSPECTION, AND MAINTENANCE

BACKGROUND

On 03 August 2005, at 0509 Mountain daylight time, Canadian National (CN) freight train M30351-03, proceeding westward from Edmonton, Alberta, to Vancouver, British Columbia, derailed 43 cars, including 1 loaded car of pole treating oil, 1 car of toluene (UN 1294), and 25 loaded cars of Bunker C (heavy fuel oil) at Mile 49.4 of the Edson Subdivision near Wabamun, Alberta. Approximately 700 000 litres of Bunker C and 88 000 litres of pole treating oil were spilled, causing extensive property, environmental and biological damage. About 20 people were evacuated from the immediate area. There were no injuries.

The *Railway Track Safety Rules* do not provide any guidance on fatigue life, nor are there common industry standards for rail life based on accumulated tonnage and the properties of the steel.

CN has developed its own Rail Defect Tracking System (RDTS), which is, in part, able to track the history of maintenance rails. Maintenance rails are selected based on observed wear and conformity to the profile of the parent rail. Neither the quality of steel nor the accumulated tonnage is factored into this decision.

In this occurrence, a maintenance rail failed because it had reached the end of its fatigue life. Because of the way the defects developed in the rail, they could not be identified by the available inspection tools. The rail was installed because it matched the profile of the parent rail; no consideration was given to matching the steel specification of the maintenance rail with the parent rail.

Inspection programs are the primary defence against rail fractures. Recognizing the limitations of existing inspection tools, there is a requirement for additional strategies to ensure that maintenance rails are not installed where they are likely to have a shorter fatigue life than the parent rail.

Current Transport Canada (TC) rules focus primarily on geometric criteria and there is no requirement to establish the fatigue life of rails. Furthermore, there are no common industry guidelines for rail life based on accumulated tonnage, defects or steel quality.

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In the absence of industry standards for rail fatigue life, rails can remain in track beyond their fatigue limit. This increases the risk of sudden rail failure and derailment. Therefore, the Board recommends that:

> The Department of Transport establish standards requiring that rails approaching their fatigue limit be replaced.
>
> R07-02

Transport Canada's Response to R07-02 (January 2008)

TC has already started work with industry to develop a long-term strategy to modernize the *Track Safety Rules* that will take into consideration the establishment of standards for the quality and strength of maintenance rails and for rails approaching their fatigue limit.

Board Assessment of Response to R07-02 (April 2008)

TC has acknowledged the deficiency and indicated that future revisions to the Track Safety Rules will take into consideration the establishment of standards for rails approaching their fatigue limit. As it is too soon to evaluate the outcome of TC's proposal, the Board assesses the response to Board Recommendation R07-02 as having *"Satisfactory Intent"*.

Additional Response to R07-02(June 2010)

The Track Safety Rules are being revised and reviewed. TC indicates that this item is planned for the next revision of the Track Safety Rules.

Board Reassessment of Response to R07-02 (June 2010)

As the revision is still planned to be included and it is too soon to evaluate the outcome of TC's proposal, the Board reassesses the response to Recommendation R07-02 to remain as having *"Satisfactory Intent"*.

Additional Information From the Railway Industry (December 2010)

By definition, the fatigue limit (life) for plain to medium carbon steels occurs when a fatigue defect is initiated. For rail, the development of shelly surface, fatigue spalling, gauge corner cracking etc. would suggest that a fatigue threshold has been reached. To protect against the development of fatigue related defects, the primary defences are rail grinding, Track Geometry Testing (which also measures rail wear) and Ultrasonic Rail Testing (UT). The TC Track Safety Rules outline the minimum frequency for Track Geometry testing (twice per year on most main track) and UT testing (at least once a year). However, both CN & CP now greatly exceed the number of specified frequencies on most main track.

Board Reassessment of Response to R07-02 (February 2011)

This increased monitoring is a pro-active maintenance activity that identifies rails which have emerging fatigue related defects, so that the rails can be repaired or replaced. Therefore, the Board reassesses the response to Recommendation R07-02 as being **Fully Satisfactory**.

Next TSB Action

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