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

REASSESSMENT OF THE RESPONSE TO RAIL SAFETY RECOMMENDATION R96-05

Locomotive fuel tank crashworthiness

Background

On 20 November 1994, VIA Rail Canada Inc. passenger train struck a piece of rail intentionally placed on the CN track near Brighton, Ontario. A fire erupted and the trailing portion of the locomotive and two passenger cars became engulfed in flames. Forty six passengers were injured, most of them during the emergency egress from the train.

As a result of safety deficiencies identified during the investigation of this occurrence, the Board recommended that:

> The Department of Transport assess the design of the current passenger locomotive fuel tanks and require, in the short term, that measures be taken to improve their crashworthiness, including limiting fuel spillage.
>
> **TSB Recommendation R96-05**

Transport Canada's response to Recommendation R96-05 (October 1996)

Transport Canada is currently gathering information in regards to the extent of any problems concerning fuel tanks, their crashworthiness and fuel spillage. Since the LRC locomotive fuel tanks are an integral part of the frame, VIA Rail has no plans to modify the configuration of the seven locomotives remaining in service.

The Department has raised the issue of crash-resistant fuel tanks and fuel systems with the Railway Association of Canada (RAC). We propose that the RAC formulate a rule that would be similar to the Association of American Railroads' (AAR) "Performance Requirements for Diesel Locomotive Fuel Tanks" which would be incorporated in the proposed Railway Locomotive Inspection and Safety Rules that are currently being developed by the railways. The new rule would include new passenger locomotives as well as new freight locomotives.

Board assessment of the response to Recommendation R96-05 (January 1997)

The susceptibility of the locomotive fuel tanks to puncture and the associated limitations in their design to minimize fuel spillage/spraying is placing the travelling public at risk. The reply indicates that TC is currently gathering information on the extent of the fuel tank problems; however, there is no mention of any evaluation on the vulnerability of the tanks to accidental rupture in order to take appropriate measures in the short term. On the one hand it appears that TC is leaving the decision to the railway industry as to the necessity to improve the crashworthiness of the tanks; on the other hand, TC advises that VIA has no plans to "modify the configuration of fuel tanks on the seven locomotives in service". Indeed, both TC and VIA seem to be limiting the scope of their assessment of fuel tank crashworthiness to only those

locomotives of the type involved in the occurrence, rather than all passenger locomotives in service.

Given that there is no planned action to reduce the susceptibility of the fuel tanks to accidental damage / fuel spillage in the short term, and there is no evidence of any substantive assessment of the inherent design risks for any passenger locomotives.

Therefore, the Board assesses the response to Recommendation R96-05 to be **Unsatisfactory**.

Transport Canada's response to Recommendation R96-05 (January 2005)

The remaining seven locomotives of the occurrence type have been removed from service. TC indicated that VIA Rail has no plans to modify the configuration of fuel tanks on older locomotives. VIA Rail is obtaining newer 900 series VIA locomotives which have puncture resistant and compartmentalized fuel tanks, and are built to meet the new AAR standard.

Board reassessment of the response to Recommendation R96-05 (May 2005)

Given that the occurrence type locomotives are removed from service and that VIA is buying new locomotives with fuel tanks that meet the crashworthiness standard, the Board reassesses the response to Recommendation R96-05 as **Satisfactory in Part**.

In consideration that no further action is planned to be taken and continued reassessment will not likely yield further results, this deficiency file is assigned **Dormant** status.

Board reassessment of the response to Recommendation R96-05 (December 2013)

This recommendation is assigned an active status following 2 VIA Rail passenger train derailments (R12T0038, R13W0124) involving locomotives that had been recently remanufactured, but had their fuel tanks punctured during the accidents.

Transport Canada's response to Recommendation R96-05 (January 2014)

Transport Canada has solicited the Railway Association of Canada and its member railways to formulate rules that would apply Association of American Railroads (AAR) crashworthiness standards to new and remanufactured locomotives.

Board reassessment of the response to Recommendation R96-05 (April 2014)

Transport Canada Rail Safety has requested the Railway Association of Canada to formulate and submit rules that would apply AAR crashworthiness standards to new and remanufactured locomotives. The AAR crashworthiness standards include, by reference to AAR Standard S-5506 (Performance Requirements for Diesel Electric Locomotive Fuel Tanks), the updated Penetration Resistance and Spill Control requirements. The proposed actions, if implemented, would significantly reduce the risk. However, the actions are not sufficiently advanced at this time.

The Board reassesses the response to Recommendation R96-05 as **Satisfactory Intent.**

Transport Canada's response to Recommendation R96-05 (February 2015)

Transport Canada approved the *Railway Locomotive Inspection and Safety Rules* formulated and submitted by the Railway Association of Canada, which state in part:

> **19. FUEL TANKS**
>
> 19.1 After January 1, 2015 fuel tanks, on new and remanufactured locomotives travelling at speeds exceeding 25 MPH (40 KPH) purchased subsequent to the approval of this rule, are to be of high impact resistant design which meet or exceed current Association of American Railroads Manual of Standards and Recommended Practices (S-5506).
>
> 19.2 Fuel tanks shall be provided with suitable liquid level gauges, so located that the fuel level in the tanks can be determined when the tanks are being filled. Gauges must be protected against accidental breakage where loss of fuel would be incurred.

Board reassessment of the response to Recommendation R96-05 (March 2015)

The new Railway Locomotive Inspection and Safety Rules, No. 19 Fuel Tanks, ensures that approved fuel tanks of high impact resistant design will be installed on new and remanufactured locomotives. By limiting damage to the fuel tank of the locomotive, this action has substantially reduced the risk of fuel loss in the event of an accident involving the fuel tank.

Therefore, the response to the recommendation is considered to be **Fully Satisfactory**.

Next TSB action

This deficiency file is **Closed**.