



REASSESSMENT OF THE RESPONSES TO TSB RECOMMENDATION M05-06

Structural fire protection

Background

On the morning of 12 May 2003, while en route from Horseshoe Bay, British Columbia, to Langdale, British Columbia, the *Queen of Surrey*, with 318 passengers and 137 vehicles on board, suffered a diesel oil fire on its No. 2 main engine. The engine room was evacuated and sealed, and carbon dioxide (CO₂) gas was released into it. Although immediate failure of the CO₂ distribution manifold allowed some of the gas to escape, enough reached the engine room to extinguish the fire. The vessel was then towed to the Langdale ferry terminal, where the passengers disembarked. There were no fatalities.

The Board issued the safety recommendation on 9 February 2006.

TSB Recommendation M05-06 (February 2006)

There are currently 118 Canadian-registered passenger vessels over 500 gross tonnage [Retrieved 30 August 2005 from the Transport Canada Vessel Registration Query System]. The Board is aware that BCFC has fitted the engine room deckheads (and bulkhead penetrations) of the *Queen of Coquitlam*, *Queen of Cowichan* and *Queen of Oak Bay* (sister ships to the *Queen of Surrey*) with A-60 structural fire protection, and intends to upgrade other similarly deficient vessels in its fleet when they undergo their mid-life refits. The Board, however, is concerned that, because of a lack of regulatory requirements for such protection, there may be other Canadian-flagged vessels with insufficient structural fire protection around high fire risk compartments. While upcoming changes proposed to the regulations will incorporate provisions for adequate structural fire protection, existing vessels may not be modified to suit, thus exposing the vessel, crew, passengers and the environment to undue risk. The Board, therefore, recommends that

the Department of Transport require Canadian passenger vessels over 500 gross tonnage to meet a standard of structural fire protection that ensures a level of safety equivalent to SOLAS-compliant vessels.

TSB Recommendation M05-06

Transport Canada's response to Recommendation M05-06 (May 2006)

The Minister of Transport, Infrastructure and Communities agrees with the intent of this recommendation. The proposed *Fire Safety Regulations* will require that new passenger vessels over 150 gross tons will meet and in some areas exceed *Safety of Life at Sea* (SOLAS) *Convention* standards for structural fire protection. The proposed regulations will also address

modifications made to existing vessels. As a result, any major modification will have to comply with the most recent requirements for structural fire protection.

All Canadian-registered passenger vessels built after 1979 were required to comply with the *Equivalent Standard for Fire Protection of Passenger Ships*, TP 2237.

The report indicates, in the background to this recommendation, that there are currently 118 Canadian-registered passenger vessels over 500 gross tons. Transport Canada records have identified 53 vessels of the 118 that were built before 1979. Of these 53 vessels, 14 have had or will have their structural fire protection upgraded. Some of these 14 vessels are owned by the British Columbia Ferries Services Inc. and will have their structural fire protection upgraded. Transport Canada considers that of the remaining 39 passenger vessels, several have the appropriate fire protection and therefore there is a diminishing number that represent an acceptable manageable risk.

Nonetheless, Transport Canada will further review the status of these remaining vessels to confirm that the risk is low, and if necessary Transport Canada will amend the proposed *Fire Safety Regulations* accordingly.

TSB assessment of Transport Canada's response to Recommendation M05-06 (October 2006)

The TSB investigation discovered that TP 2237 standards are optional and compliance with these standards or the existing *Hull Construction Regulations* was left to the vessel owner's discretion. An example of this are the five 'C' Class ferries built by BC Ferries (of which the *Queen of Surrey*, built in 1981, is one) which did not comply with TP 2237 and therefore did not have adequate structural fire protection.

While upcoming changes proposed to the *Fire Safety Regulations* will incorporate provisions for new vessels and older non-compliant vessels undergoing major modifications, the remaining vessels may not be modified, thus exposing the vessel, crew, passengers and the environment to undue risk.

TC's planned action or the action taken will reduce, but not substantially reduce or eliminate the deficiency.

Therefore, the assessment is assigned **Satisfactory in Part**.

Transport Canada's response to Recommendation M05-06 (June 2008)

TC's update, dated June 2008, indicated that the proposed *Fire Safety Regulations* will require that new passenger vessels over 150 gross tons will meet and in some areas exceed *Safety of Life at Sea (SOLAS) Convention* standards for structural fire protection. The proposed regulations will also address major modifications made to existing vessels and any major modification will have to comply with the requirements for structural fire protection.

All Canadian-registered passenger vessels built after 1979 were required to comply with TP 2237, *Equivalent Standard for Fire Protection of Passenger Ships*. Transport Canada will review the status of these remaining vessels to confirm that the risk is low, and if necessary Transport Canada will amend the proposed *Fire Safety Regulations* accordingly. The proposed *Fire Safety Regulations* are expected to be pre-published in Part I of the *Canada Gazette* in the fall 2008.

TSB reassessment of Transport Canada's response to Recommendation M05-06 (September 2008)

No substantial change to address the safety deficiency since the last assessment. Follow-up information indicated that the proposed *Fire Safety Regulations* are expected to be pre-published in Part I of the *Canada Gazette* in the Fall 2009.

Therefore, the assessment of the response remains at **Satisfactory in Part**.

Transport Canada's response to Recommendation M05-06 (November 2009)

TC's update, dated November 2009, indicated that the proposed *Vessel Fire Safety Regulations* will require that new passenger vessels over 150 gross tons meet, and in some areas exceed, the SOLAS Convention standards for structural fire protection. The proposed regulations will also address major modifications made to existing vessels which will have to comply with the requirements for structural fire protection. All Canadian-registered passenger vessels built after 1979 were required to comply with the Equivalent Standard for Fire Protection of Passenger Ships, TP 2237.

TC will review the status of these remaining vessels to confirm that the risk is low, and if necessary Transport Canada will amend the proposed *Vessel Fire Safety Regulations* accordingly. The proposed *Vessel Fire Safety Regulations* are anticipated to be pre-published in Part I of the *Canada Gazette* in the spring 2010.

TSB reassessment of Transport Canada's response to Recommendation M05-06 (May 2010)

TC has yet to determine whether the proposed *Vessel Fire Safety Regulations* will be amended to address those remaining vessels built before 1979 and to which the current regulations do not apply. However, TC has indicated that the proposed *Vessel Fire Safety Regulations* will require that new passenger vessels over 150 gross tons meet, and in some areas exceed, the SOLAS Convention standards for structural fire protection. It is now anticipated that the proposed regulations will be pre-published in the *Canada Gazette*, Part I, in the summer of 2010.

Therefore, the assessment of the response remains at **Satisfactory in Part**.

Transport Canada's response to Recommendation M05-06 (December 2010)

TC's December 2010 update indicated that the proposed *Vessel Fire Safety Regulations* will require that new passenger vessels over 150 gross tons meet, and in some areas, exceed the SOLAS Convention standards for structural fire protection. The proposed regulations will also address major modifications made to existing vessels and they will have to comply with the requirements for structural fire protection. All Canadian-registered passenger vessels built after 1979 were required to comply with the *Equivalent Standard for Fire Protection of Passenger Ships*, TP 2237.

A review of TC records indicated that there are 36 ferry and passenger vessels built before 1979 that have an active status. Of these, 10 are passenger vessels and not subject to risk of fire on car decks. Of the remainder, a large number have been or will be upgraded to current requirements for structural fire protection through mid-life refit, or will be withdrawn from service.

Accordingly, TC considers the risk to be low, and that no amendment to the proposed *Vessel Fire Safety Regulations* is required. The proposed *Vessel Fire Safety Regulations* are anticipated to be pre-published in Part I of the *Canada Gazette* in the second quarter of 2011.

TSB reassessment of Transport Canada's response to Recommendation M05-06 (May 2011)

TC has determined that the structural fire protection provisions of the proposed *Vessel Fire Safety Regulations* will not be amended to include certain non ro-ro passenger vessels built prior to 1979. Regardless of whether a passenger vessel is equipped with car decks or not, the risk of fire spreading through bulkheads and decks exists. The Board remains concerned that, because of a lack of regulatory requirements for such protection, there continues to be other Canadian-flagged passenger vessels with insufficient structural fire protection around high fire risk compartments.

Transport Canada has stated that it will not be taking action to include vessels built before 1979. Therefore, the assessment of Transport Canada's response remains **Satisfactory in Part**.

Transport Canada's response to Recommendation M05-06 (December 2011)

The proposed *Vessel Fire Safety Regulations* will require that new passenger vessels over 150 gross tons meet, and in some areas exceed, the Safety of Life at Sea Convention standards for structural fire protection. The proposed regulations will also address major modifications made to existing vessels, which will have to comply with the requirements for structural fire protection. All Canadian-registered passenger vessels built after 1979 were required to comply with the *Equivalent Standard for Fire Protection of Passenger Ships, TP 2237*.

The *Hull Construction Regulations* already require passenger vessels to have A 60 rated insulation between the engine room, accommodation spaces and other spaces such as control stations. Ro-ro ferries did not require fire protection on the deck head above the engine room in way of car decks, however, as these were interpreted as open spaces until the publication of the *Equivalent Standard for Fire Protection of Passenger Ships, TP 2237*.

A review of Transport Canada inspection records indicates that there are 91 passenger vessels of more than 500 gross tonnage that are in active service (or will be shortly) in Canada (e.g. holding a passenger vessel inspection certificate in 2010 or after). Fifty-five of these were built or rebuilt after 1979. Of the remaining 36, seven are passenger vessels and not subject to risk of fire on car decks. Of the remaining 29, a large number either have been or will be upgraded to current requirements for structural fire protection through mid-life refit, or will be withdrawn from service.

Transport Canada will continue to work with the owners and the Canadian Ferry Operators Association to monitor the status of the fleet and to verify that structural fire protection is upgraded when a major modification is made.

Accordingly, Transport Canada considers the risk to be low and given the above information that the recommendation is met, and that no amendment to the proposed *Vessel Fire Safety Regulations* is required. The proposed *Vessel Fire Safety Regulations* are anticipated to be published in the *Canada Gazette, Part II*, in the 1st Quarter of 2012.

TSB reassessment of Transport Canada's response to Recommendation M05-06 (March 2012)

TC has determined that the structural fire protection provisions of the proposed *Vessel Fire Safety Regulations* will not be amended to include certain non ro-ro passenger vessels built prior to 1979. Regardless of whether a passenger vessel is equipped with car decks or not, the risk of fire spreading through bulkheads and decks exists. The Board remains concerned that, because of a lack of regulatory requirements for such protection, there continues to be other Canadian-flagged passenger vessels with insufficient structural fire protection around high fire risk compartments placing passengers, crew and vessels at risk.

Since TC has restated that they will not be taking action to include and regulate vessels built before 1979, the assessment of the response remains as **Satisfactory in Part**.

Transport Canada's response to Recommendation M05-06 (April 2018)

There are currently 38 passenger vessels of more than 500 gross tonnage built before 1979 still operating in Canada. TC indicates that a large number of these vessels have already been subject to modernization and have had their structural fire protection upgraded. The new *Vessel Fire Safety Regulations* require that the part of vessel subject to modifications be compliant with the new requirements. A number of other vessels will be removed from service in the coming years.

Transport Canada does not currently have the compiled numbers for how many of these 38 vessels have upgraded structural fire protection. TC knows that older vessels are eventually taken out of service, considering all major operators have new building projects. For example, BC Ferries has put in service 3 liquefied natural gas (LNG) fuelled ferries to replace existing vessels. Two new ferries are also being built to serve the Northern Gulf Islands. In Quebec, the Société des traversiers du Québec (STQ) has replaced the *Camille Marcoux* with the *F.A. Gauthier*, and two new ferries are being built for the Saguenay River crossing. Other large and medium size ferries are being replaced across the country, such as the *MV Legionnaire* in Newfoundland, which was built in 2015, as well as the new Pelee Islander, Wolfe Island and Amherst Island ferries projects in Ontario. In addition to ferry replacement projects, major operators have mid-life/modernization programs, such as the current BC Ferries Spirit class conversion project.

Transport Canada considers that the residual risk is low and will continue to decrease. Taking the potential costs and benefits into consideration, TC does not believe that regulatory action is justified.

TSB reassessment of Transport Canada's response to Recommendation M05-06 (June 2018)

TC has not compiled exact numbers on how many of the 38 passenger vessels in question have upgraded structural fire protection, but expects that a large number of these vessels will be phased out, as operators have built or are in the process of building replacement vessels that comply with the new *Vessel Fire Safety Regulations*. Although there have been no major occurrences of fire on passenger vessels since the *Queen of Surrey* occurrence in 2003 and TC considers the residual risks to be low, the number of passenger vessels built before 1979 operating in Canadian waters that would need either an upgrade or removal from service is

unknown. Without having exact numbers, the TSB cannot confirm that the risk to these vessels has been mitigated.

The Board considers the response to the recommendation to be **Satisfactory in Part**.

Transport Canada's response to Recommendation M05-06 (January 2019)

Transport Canada (TC) disagrees with this recommendation. The Department assesses that it is unlikely to reduce existing risks. In the spring/summer of 2018, TC conducted research to identify all active passenger vessels of over 500GT built prior to 1979 in order to confirm the status of their engine room structural fire protection. Thirty-five (35) vessels were identified, with only three (3) of those vessels having not yet been upgraded to the minimum requirements of TP 2237 – Equivalent Standards for Fire Protection of Passenger Ships. This TP enumerates various fire protection requirements including structural protection of machinery spaces. These requirements have now been incorporated into the *Vessel Fire Safety Regulations* (VFSR). Of those three ships, one has not been in service for the last 10 years and another is scheduled to be replaced in 4 years.

Of the vessels with upgraded structural fire protection, twenty-two (22) meet the requirements of the new VFSR and five (5) are already under construction to meet the requirement stated in TP 2237. The remaining vessels display various levels of insulation ranging from A-60 insulation on engine room decks to a combination of A-0, A-30 and A-60 protection in adjacent spaces.

The research supports TC's view that the fire risk is low, as only two active vessels are not equipped with fire protection boundary insulation, and that any modification to the structural fire protection of their engine rooms will be required to comply with the VFSR which have been updated to include modern, performance-based regulations that align with international regulatory instruments and standards while also including Canadian alternatives and supplements to address unique Canadian circumstances.

Transport Canada considers that the residual risk is low and will continue to decrease. Taking the potential costs and benefits into consideration, TC does not believe that further regulatory action is justified.

TSB reassessment of Transport Canada's response to Recommendation M05-06 (March 2019)

The Board notes that TC identified 2 active Canadian passenger vessels over 500 GT built prior to 1979 that are not in compliance with the *Vessel Fire Safety Regulations* (VFSR). The Board also notes that these vessels would have to comply with the VFSR in case of a major structural fire protection modification. Given this small number of active vessels, the residual risk is considered low. The Board considers the response to the recommendation to be **Fully Satisfactory**.

As the residual risk is considered low, the deficiency file is **Closed**.