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

ASSESSMENT OF THE RESPONSE FROM TRANSPORT CANADA TO MARINE SAFETY RECOMMENDATION M04-03

PASSENGER EVACUATION

Background

The *Lady Duck* was an amphibious vehicle based on the conversion of a Ford F-350 truck chassis and arranged to carry up to 12 passengers on combined road and water-borne tours in the National Capital Region and on the Ottawa River. The vehicle was developed and built by the owner and entered commercial service at the start of the tourist season in June 2001.

The *Lady Duck* started the amphibious tour at about 1500 on 23 June 2002, with the driver, 10 passengers and a tour guide on board. When the vehicle entered the water at the Hull Marina, the main bilge pumps were switched on to clear the hull of any shipped water. Because no water was seen to be discharging from the outlets, the emergency bilge pumps were also switched on. Water was then seen to be discharging intermittently from outlets on both sides of the vehicle. The vehicle was driven to the Ottawa side of the river to various points of interest. The river was calm, with waves caused by wakes from boats and other watercraft in the tour area. On occasion, the vehicle encountered waves that washed over the hood and up to the windshield.

Toward the end of the tour, while returning to the Hull Marina, the driver noticed that the front end of the vehicle was floating lower than normal and that water was being continuously discharged from both sides of the vehicle. The driver then ordered the four foremost passengers and the tour guide to move to the back of the vehicle to try to decrease the forward trim.

The forward trim continued to increase and, realizing that the safety of passengers was at risk, the driver instructed the tour guide to tell passengers to don personal flotation devices. The driver then broadcast a MAYDAY on very high frequency (VHF) radio. The situation deteriorated rapidly as more floodwater accumulated in the forward end of the vehicle. The driver then called on the passengers to abandon the sinking vehicle. The driver, tour guide and six passengers managed to get free of the sinking vehicle. The remaining four passengers became trapped under the fabric awning and sank with the vehicle in 8 metres of water.

Canada

The passengers and crew of the *Lady Duck* experienced difficulties in abandonment due to the rapidity of the sinking, the trim of the vehicle as it sank, and the overhead canopy that prevented passengers from floating free from the vehicle. Additionally, other design features, such as the narrow aisle between the seats, the inadequate exit door aft, two windows that were zipped closed, and the lack of exit signage on the side windows, contributed to a bottleneck when passengers attempted to evacuate the vessel. As a result, the *Lady Duck* sank so rapidly that some of the passengers were unable to egress before the vehicle was underwater, and they drowned.

Board Recommendation M04-03

Small passenger vessels are rarely of standardized design and, consequently, the arrangements for boarding, accommodating, and disembarking passengers vary greatly, particularly in vessels of novel construction such as the *Lady Duck*. Transport Canada (TC) has standards for commercial passenger vehicles, such as buses, trains and aircraft, and, to a lesser extent, for small passenger vessels with a gross tonnage greater than 15 or carrying more than 12 passengers. However, there are no statutory requirements for small passenger vessels, such as the *Lady Duck*, to be ergonomically designed to afford passengers and crew the best possible opportunity to safely evacuate in the event of an emergency. Regulatory amendments are being proposed to incorporate by reference the *Construction Standards for Small Vessels* (TP 1332). However, review indicates that small commercial vessels in excess of 6 m, such as the *Lady Duck*, are not required to incorporate sufficient inherent buoyancy to prevent sinking, and there are no provisions for the timely and unimpeded evacuation of passengers in the event of an emergency. The Board recommended that:

> The Department of Transport ensure that small passenger vessels incorporate sufficient inherent buoyancy and/or other design features to permit safe, timely and unimpeded evacuation of passengers and crew in the event of an emergency.
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> M04-03

Response to Recommendation M04-03

In its 26 August 2004 letter, TC provided the following comments:

- TC agrees with the intent of the recommendation and has commissioned a study on the design, construction and operation of the four models of amphibious vehicles operating in Canada. The study will help to determine which requirements are recommended to address concerns related to intact and damaged stability, swamping and means of escape. The study is scheduled to be completed in September 2004 and will examine regulatory requirements in Canada, Australia, the United States and the United Kingdom.

- TC will also examine the anticipated Coroner's investigation and report on the accident in order to help determine what actions should be taken with respect to amphibious vehicles.

- TC will continue to promote and enforce existing requirements that aim to equip passengers and crew to respond quickly and effectively to emergencies, including pre-departure safety briefings for passengers and the requirement for operators to complete a course in Marine Emergency Duties.

Board Assessment of Response to M04-03

The study on the design, construction and operation of the four models of amphibious vehicles operating in Canada was completed in February 2005. The study contained 13 recommendations to further enhance the safety of amphibious vehicles and addressed intact and damage stability, swamping and means of escape. TC will review the study and its recommendations, and take into consideration all comments from interested parties, including that which may come from an anticipated coroner's investigation, prior to implementing any additional safety requirements. TC is currently in the process of approving a simplified intact stability assessment policy for existing small non-pleasure vessels over 6 metres but not more than 12 metres.

Given that TC has initiated an examination of regulatory requirements with a view to addressing concerns respecting means of escape related to amphibious vehicles, the response is considered to be **Satisfactory Intent.**

Next TSB Action: M04-03

Any actions taken as a result of the study will be followed up.