



**BOSTON
DUCK
TOURS**

MC 2000445
St. 7222A
MC to SR

March 24, 2000

Jim Hall, Chairman
National Transportation Safety Board
490 L'Enfant Plaza, S.W.
Washington, D.C. 20594

Re: Safety Recommendation M-00-5

Dear Chairman Hall:

Boston Duck Tours ("BDT") has received your letter dated February 18, 2000 regarding Safety Recommendation M-00-5. BDT is very pleased that the NTSB is reviewing safety issues as they pertain to amphibious vehicles, and BDT is committed to working with the NTSB and other authorities to ensure the continued safety of the amphibious vehicle tour industry.

Your letter described the tragic sinking of the *Miss Majestic* in May, 1999. You are no doubt aware that the United States Coast Guard issued a report dated September 29, 1999 containing the results of its investigation into the circumstances surrounding the sinking of the *Miss Majestic*. The Coast Guard report listed contributing causes of the casualty, with boot seal installation as the first-listed cause. The Coast Guard report concluded that:

"The apparent root cause of this casualty was the unchecked flooding of the MISS MAJESTIC resulting from the aft shaft boot seal dislodging from the shaft housing at the start of waterborne operation."

In describing the *Miss Majestic* tragedy, your correspondence of February 18th also pointed to boot seal problems, noting that "the boot on the aft end of the aft driveshaft housing had completely slipped off the housing." Later in your letter it is noted that a failed driveshaft boot can be the cause of amphibious vessel flooding.

In light of the boot seal issue identified in the investigation regarding the *Miss Majestic*, BDT strongly believes that safety recommendations regarding boot seal re-engineering and replacement would greatly contribute to the continued safety of the amphibious vehicle tour industry. Moreover, proven technology -- currently in use by BDT on all of its amphibious vehicles -- exists to address the boot seal deficiencies that led to the *Miss Majestic* tragedy. Central to this technology is the double clamping of boot seals. In 1999, BDT implemented a boot seal shaft replacement with a carrier bearing on its entire fleet.¹ This system, which the Boston office of the Coast Guard has reviewed and approved, is the result of BDT's own research and development efforts. BDT devoted these efforts because it believed that there was substantial room for improvement over the original boot seal system. Others have developed methods designed to address the boot seal issue. BDT supports the development of such other technology -- such as restricter plates and diaphragms (which restrict water flow into the vessel) -- provided that such methods also involve the double clamping of boot seals.

Given the findings regarding the *Miss Majestic* and the availability of technology designed to remedy the very factor that was central to the *Miss Majestic*'s sinking, BDT strongly urges the NTSB to consider safety recommendations encouraging all operating companies and amphibious vessel manufacturers/refurbishers to re-engineer and replace their boot seal systems to prevent amphibious vessel flooding. To this end, BDT is prepared to further discuss its technology with the NTSB.

BDT has made various other technological and safety improvements to its fleet, which BDT has shared with the national office of the Coast Guard. We hope that BDT's recommendations will be incorporated in the anticipated national safety standards to be issued by the Coast Guard for the DUKW vehicle industry.

We would welcome the opportunity to discuss our various technological developments with the NTSB. In this regard, enclosed please find an invitation to a presentation being made by BDT on March 31, 2000. We encourage any NTSB board members or staff members to attend, learn about our operation, and present any questions that they may have.

With respect to the reserve buoyancy recommendations set forth in your letter, in December, 1999 -- two months prior to your letter containing Safety Recommendation M-00-05 -- BDT engaged JMS Naval Architects / Salvage Engineers of Groton, Connecticut ("JMS"). We understand that JMS is the recognized naval architectural firm

¹ BDT developed this technology in 1998, first putting it into service in April, 1999. BDT has further refined this technology; in April, 2000, the refined technology will go into service on the entirety of BDT's fleet.

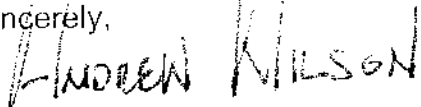
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engaged by the NTSB in connection with Safety Recommendation M-00-05. BDT first approached JMS on December 8, 1999, the same day that JMS's president, Jack Ringelberg, gave a presentation at the NTSB's Amphibious Passenger Vessel Safety Public Forum Meeting held in Memphis, Tennessee. Since that date, JMS has been working with BDT in an effort to develop technology that we hope can be implemented in BDT's amphibious vehicles to address the NTSB's reserve buoyancy recommendations.

BDT has worked closely with JMS in an effort to develop the practical implementation of the NTSB's reserve buoyancy recommendations, and I would be happy to discuss with you the extent of our efforts made to date. These efforts include partially tearing apart one of BDT's amphibious vessels for informational and design purposes. BDT intends to continue working with JMS, and will make those approved (United States Coast Guard) changes that can be practically implemented.

Once again, BDT is appreciative of the NTSB's input to assure the continued safety of the amphibious vehicle tour industry. I hope to hear from you in response to this letter. I can be reached at the address set forth on this letterhead or directly at (617) 227-5296.

Sincerely,

A handwritten signature in black ink that reads "ANDREW WILSON". The signature is written in all caps and has a slightly cursive, informal style.

Andrew Wilson
President of SEAWEED INCORPORATED,
General Partner for Boston Duck Tours, Limited Partnership

Enclosure

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Mr. Andrew Wilson
General Partner
Boston Duck Tours
790 Boylston Street
Plaza Level
Boston, Massachusetts 02199

MAY 11 2000

Dear Mr. Wilson:

The National Transportation Safety Board has received your March 24, 2000, letter concerning the action taken by the Boston Duck Tours (BDT) on Safety Recommendation M-00-5, stated below.

M-00-5

Without delay, alter your amphibious passenger vessels to provide reserve buoyancy through passive means, such as watertight compartmentalization, built-in flotation, or equivalent measures, so that they will remain afloat and upright in the event of flooding, even when carrying a full complement of passengers and crew.

The Safety Board is pleased with the cooperation and assistance that BDT has provided during the course of this investigation and appreciates the efforts to improve DUKW safety. Although unable to attend BDT's March 31, 2000, presentation, members of the Board's Office of Marine Safety are aware of the alterations in boot seals that you describe in your letter. It is clear that BDT believes the solution to the problem lies in re-engineering the boot seal. It was in recognition of the possibility that other solutions to the problem may be developed that the Safety Board included the phrase "or equivalent measures" in Safety Recommendation M-00-5. However, while engineering efforts in this area may provide an improvement in safety, the Safety Board is concerned that any alternative solution provide at least as much protection as would be provided by adequate built-in reserve buoyancy.

The Board understands that BDT is working with JMS Naval Architects/Salvage Engineers to provide reserve buoyancy to its DUKWs through passive means. The Safety Board is gratified that BDT has taken such action and commends BDT for its open mindedness and for its willingness to explore practical ways to implement the recommended action. Accordingly, Safety Recommendation M-00-5 has been classified "Open—Acceptable Response," pending further response from BDT about its progress in implementing the safety recommendation.

Thank you for your cooperation and commitment to marine safety.

Sincerely,

ORIGINAL SIGNED BY
JIM HALL
Jim Hall
Chairman

MBrown:SR10:drafted 4/3/00, revised per MS1 5/2/00; final: 5/9/00sp
MC2000445; Nota. 7089A; Nota. 7222A; Rec. M-00-5
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Proofread by: 5/9/00sp

Routing Symbol	SR-10 SPEC.	SR EDITOR	SR-10 CHIEF	MS-x	MS-1	RE-1	RE-x	SR-2A	SR-1
Date	4/3/00	5/1/00	5/1/00	MS-10	5/3	N/A	N/A	5/5	5/9
Initials	mtb	41	EDB	277	ETP	N/A	N/A	EPW	EPW

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