

NATIONAL TRANSPORTATION SAFETY BOARD
Virtual Meeting of April 28, 2020
(Information subject to editing)

Sinking of Amphibious Passenger Vessel *Stretch Duck 7*
Table Rock Lake, near Branson, Missouri
July 19, 2018
NTSB/MAR-20/01

This is a synopsis from the NTSB's report and does not include the Board's rationale for the conclusions, probable cause, and safety recommendations. NTSB staff is currently making final revisions to the report from which the attached conclusions and safety recommendations have been extracted. The final report and pertinent safety recommendation letters will be distributed to recommendation recipients as soon as possible. The attached information is subject to further review and editing to reflect changes adopted during the Board meeting.

Executive Summary

About 1908 central daylight time on July 19, 2018, the *Stretch Duck 7*, a 33-foot-long, modified World War II-era DUKW amphibious passenger vessel that was operated by Ripley Entertainment Inc. dba Ride the Ducks of Branson, sank during a storm with heavy winds that developed rapidly on Table Rock Lake near Branson, Missouri. Of the 31 persons aboard, 17 fatalities resulted. Several hours prior to the accident, the National Weather Service had issued a severe thunderstorm watch for the area, followed by a severe thunderstorm warning a minute before the vessel departed the shoreside boarding facility—a roadside building about 6 miles away from the lake where the tours commenced and concluded. Due to the approaching weather, the manager-on-duty advised the captain and driver as passengers were boarding the vessel to complete the lake portion of the tour before the land tour (which normally occurred first). In addition, three other company vessels also began waterborne tours following the severe thunderstorm warning. About 5 minutes after the *Stretch Duck 7* entered the water, the leading edge of a storm front, later determined to be a “derecho,” passed through the area generating strong winds and waves reportedly 3- to 5-feet high, with the highest wind gust recorded at 73 mph. The *Stretch Duck 54*, which entered the lake about 2 minutes before the *Stretch Duck 7* and was conducting a tour on the lake, was able to exit the water after experiencing the severe weather. During its effort to reach land, the *Stretch Duck 7* took on water and sank approximately 250 feet away from the exit ramp. Several first responders, along with the crewmembers and passengers aboard a paddlewheeler moored nearby, rescued and triaged 14 passengers, 7 of whom were transported to a local hospital. Loss of the vessel was estimated at \$184,000. Investigators retrieved and reviewed audio and video data from the vessel's digital video recorder system, which provided first-hand observation of the circumstances leading up to the accident.

Safety Issues

The safety issues identified in this accident, some of which have been identified in previous accidents involving amphibious passenger vessels, include the following:

- **Company Oversight.** On the day of the accident, the National Weather Service issued a severe thunderstorm watch at 1120 effective until 2100. Later, at 1832, a warning advising of 60-mph wind gusts effective until 1930 was issued. Around this time, the manager-on-

duty for Ride the Ducks instructed the captain and the driver of the *Stretch Duck 7* to complete the lake portion of the tour first before the usual land tour. Three other company vessels also began their waterborne tours after the warning, entering the lake a few minutes apart from 1845 to 1854; the *Stretch Duck 7* was the last to enter the water at 1855. Company policy restricted water entry when “severe weather” was approaching but lacked a go/no-go policy providing specific guidance when to suspend operations in a timely manner before arrival of a storm.

- **Engine Compartment Ventilation Closures.** The air intake hatch, which was designed to allow ventilation and combustion air into the engine space, was located on the most forward point of the bow on the *Stretch Duck 7*. The hatch was equipped with a spring-loaded damper that was closed as the vessel encountered severe weather but could not be secured against opening, because it was held closed in the upward position only by spring force. As the bow dipped beneath successive waves, a substantial amount of water likely entered the vessel through the nearly 3-square-foot opening.
- **Reserve Buoyancy.** The *Stretch Duck 7* did not have any compartmentalization or subdivision that would have contained the floodwater entering the engine compartment. The accident vessel and other DUKW amphibious passenger vessels were originally constructed with a low freeboard, an open hull, and no subdivision or flotation, resulting in a design without adequate reserve buoyancy. The NTSB has been concerned with the lack of sufficient reserve buoyancy of these vessels since the 1999 sinking of the *Miss Majestic*, another DUKW vessel that also had no subdivision or flotation. The NTSB issued a safety recommendation in 2002 to the Coast Guard to address this issue, but the recommendation was classified “Closed—Unacceptable Action” the following year. In November 2019, the NTSB issued a similar recommendation to the Coast Guard that required original and stretch DUKWs to have sufficient reserve buoyancy through passive means to improve survivability. (M-19-15)
- **Survivability.** The passenger compartment was enclosed by a fixed canopy with associated framing and side curtains, which can create an impediment to passenger egress during an abandonment of a vessel. Just before the vessel sank, the captain released the portside curtain on the *Stretch Duck 7*. With the starboard-side curtain closed and the vessel’s canopy, passengers were limited in their escape from the sinking vessel. These impediments, as well as procedures that call for donning lifejackets within an enclosed space (under a canopy), have been concerns in previous accidents and the subject of previous recommendations involving amphibious vessels.
- **Coast Guard Guidance: NVIC 1-01.** The Coast Guard’s guidance that was developed in 2000 after the *Miss Majestic* sinking does not effectively address the issues and circumstances found in the *Stretch Duck 7* sinking, including operations during approaching severe weather and emergency egress during rapid sinking.

Findings

1. The *Stretch Duck 7*’s propulsion, steering, and bilge systems operated normally and thus were not factors in this accident.

2. Neither alcohol nor other impairing drugs were factors in this accident.
3. On the day of the accident, the National Weather Service accurately forecasted and issued timely notifications of a severe thunderstorm that would impact the accident location.
4. Ride the Ducks did not effectively use all available weather information to monitor the approaching severe weather and assess the risk it posed to its waterborne operations.
5. Ride the Ducks should have suspended waterborne operations for the *Stretch Duck 7* and the other last tours of the day in anticipation of imminent severe weather.
6. Ride the Ducks should have had specific guidance for the operations team to determine when to suspend waterborne operations due to approaching severe weather (go/no-go policy).
7. It is likely that the captain believed he could safely complete the waterborne portion of the tour before the thunderstorm arrived.
8. The captain's decision to head toward the exit ramp when encountering the severe weather was appropriate.
9. Initial water ingress to the *Stretch Duck 7* was likely from waves rolling over the air intake hatch's spring-loaded damper and intermittently opening it, thereby allowing water into the engine compartment.
10. The rapid sinking of the *Stretch Duck 7* resulted from uncontrolled progressive flooding due to a lack of subdivision.
11. Had the Coast Guard implemented Safety Recommendation M-02-1 to require sufficient reserve buoyancy through passive means, the *Stretch Duck 7* likely would not have sunk.
12. The *Stretch Duck 54* was able to exit the lake while exposed to the same conditions as the *Stretch Duck 7* due to the increased freeboard, greater reserve buoyancy, and a securable bow hatch that prevented the ingress of water.
13. When the vessel sank, the closed starboard-side curtain aboard the *Stretch Duck 7* impeded egress and likely resulted in additional fatalities.
14. Donning lifejackets on the *Stretch Duck 7* while fitted with an overhead canopy would have created an impediment to escape, would have increased the risk of persons being entrapped, and could have resulted in additional fatalities.
15. The actions of the crew and passengers aboard the *Showboat Branson Belle* prevented more fatalities.

16. The response by emergency services was timely and effective.
17. Improved training is needed for small passenger vessel operators on rivers routes to recognize and better understand weather conditions.
18. Navigation and Vessel Inspection Circular (NVIC) 1-01 did not effectively address the NTSB's 2002 recommendation (M-02-2) to require the removal of, or the Coast Guard's approval of, fixed canopies and, consequently, likely increased the number of fatalities.
19. Navigation and Vessel Inspection Circular (NVIC) 1-01 does not account for circumstances found in the *Stretch Duck 7* accident, including operations during approaching severe weather and emergency egress during rapid sinking, and should be updated to provide guidance accordingly.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the sinking of the amphibious passenger vessel *Stretch Duck 7* was Ripley Entertainment Inc. dba Ride the Ducks of Branson's continued operation of waterborne tours after a severe thunderstorm warning was issued for Table Rock Lake, exposing the vessel to a derecho, which resulted in waves flooding through a non-weather-tight air intake hatch on the bow. Contributing to the sinking was the Coast Guard's failure to require sufficient reserve buoyancy in amphibious vessels. Contributing to the loss of life was the Coast Guard's ineffective action to address emergency egress on amphibious passenger vessels with fixed canopies, such as the *Stretch Duck 7*, which impeded passenger escape.

New Recommendations

As a result of its investigation of this accident, the National Transportation Safety Board makes the following six new safety recommendations:

To the US Coast Guard

1. Require that amphibious passenger vessels equipped with forward hatches enable operators to securely close them during waterborne operations to prevent water ingress.
2. Review the circumstances of the *Stretch Duck 7* sinking and other amphibious passenger vessel accidents, and revise Navigation and Vessel Inspection Circular (NVIC) 1-01 to address the issues found in these accidents, including operations during imminent severe weather and emergency egress during rapid sinking.
3. Examine existing training and knowledge requirements for understanding and applying fundamental weather principles to waterborne operations for Coast Guard-credentialed masters who operate small passenger vessels; and, if warranted, require additional training requirements for these ratings on recognition of critical weather situations in pre-departure planning and while under way.

To Ripley Entertainment Inc. dba Ride the Ducks

4. Using the operating restrictions found in vessel certificates of inspection, review and revise your current operating policy to provide specific guidance on vessel operations when adverse conditions could be encountered during any part of the waterborne tour by implementing a go/no-go policy.
5. Modify spring-loaded forward hatches of modified DUKW amphibious passenger vessels to enable their closure during waterborne operations as a prevention for water ingress.
6. Re-evaluate emergency procedures regarding the donning of lifejackets aboard modified DUKW amphibious passenger vessels when equipped with fixed canopies.

Previously Issued Recommendations

As a result of its investigation of this accident, the National Transportation Safety Board issued the following two safety recommendations, which currently are classified as “Open—Initial Response Received”:

To the US Coast Guard

Require DUKW amphibious passenger vessels (commonly referred to as original and/or “stretch” DUKWs) to have sufficient reserve buoyancy through passive means, so that they remain upright and afloat with a full complement of passengers and crewmembers in the event of damage or flooding. (M-19-15)

For DUKW amphibious passenger vessels without sufficient reserve buoyancy (commonly referred to as original and/or “stretch” DUKWs), require the removal of canopies, side curtains, and their associated framing during waterborne operations to improve emergency egress in the event of sinking. (M-19-16)