

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division
Washington, DC 20594

January 20, 2011

On-Board Video Factual Report

Specialist's Factual Report By Christopher Babcock

1. EVENT

Location: Philadelphia, Pennsylvania
Date: July 7, 2010, 14:37 Eastern Daylight Time (EDT)
NTSB Number: DCA10MM025

2. GROUP

A video group convened on September 3, 2010.

Chairman: Christopher Babcock
Aerospace Engineer
National Transportation Safety Board

Member: Frank English
Fleet Operations Manager
Ride the Ducks

Member: Thomas Roth-Roffy
Investigator-In-Charge
National Transportation Safety Board

Member: CWO3 Andrew J. Shock
Investigator
United States Coast Guard

Member: Thomas Sullivan
Chief Operating Officer
K-Sea

3. SUMMARY

On Wednesday July 7, 2010, the empty 250-foot sludge barge *The Resource*, towed alongside the 78.9-foot towing vessel *M/V Caribbean Sea*, allided with the anchored 33-foot amphibious small passenger vessel *DUKW 34* in the Delaware River near Philadelphia, PA. The *DUKW 34*, operated by Ride the Ducks, carried 35

passengers and 2 crewmembers. Five crewmembers were on board the *Caribbean Sea*. As a result of the collision the *DUKW 34* sank in approximately 55 feet of water. Two passengers aboard the *DUKW 34* were fatally injured and 26 passengers suffered minor injuries. No one aboard the *Caribbean Sea* was injured.

After salvaging the *DUKW 34* from the Delaware River, a video camera was discovered in the wreckage and forwarded to the National Transportation Safety Board's Vehicle Recorder Laboratory for analysis.

4. DETAILS OF INVESTIGATION

On July 13, 2010, the NTSB Vehicle Recorder Laboratory received the following recording device (Figure 1):

Recorder Manufacturer/Model: **Sony Handicam**
Recorder Serial Number: **1076456**



Figure 1. Recovered Sony Handicam.

4.1. Recorder Description

The Sony Handicam recorded analog video in Phase Alternating Line (PAL) format onto an 8-mm cassette tape. PAL format is commonly used in Europe. It differs from the National Television System Committee (NTSC) format used in the United States by employing a 25 frame per second scan rate instead of 29.97 frames per second, as well as using additional lines of vertical resolution.

4.2. Damage Description

Despite arriving at the lab damp from the submergence in river water, the recorder did not display any other mechanical damage. The tape was extracted from the cassette, rinsed, and dried (Figure 2). The tape was then reeled on new reels and placed in a donor cassette and digitized.

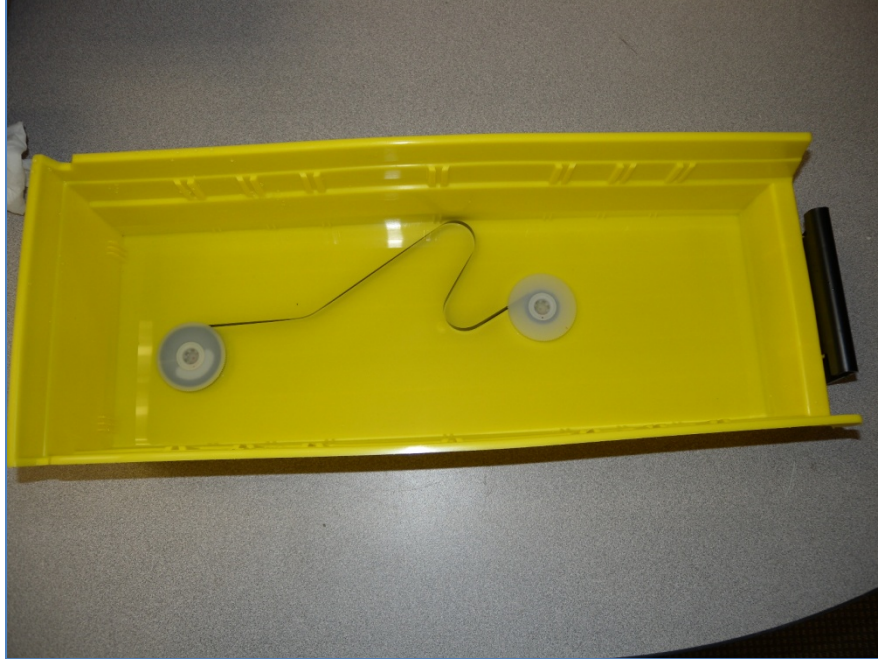


Figure 2. Rinsing the extracted tape.

4.3. Recording Contents

The recording lasted approximately one hour, forty nine minutes. The video group convened at NTSB Headquarters on September 3, 2010, to summarize its contents. As the video cuts in at several points during the recording, there was no reliable way to introduce a valid time stamp, so all time referenced below are in elapsed time on the tape.

The first hour and thirty seven minutes contain footage from sights in New York and Philadelphia. The DUKW portion of the video begins at 1:37:50 elapsed time. The DUKW is parked port side to a curb. The engine hood, windshield, and side windows are open. There is no visible damage to the port side of the vehicle. Passengers are preparing to embark. All life preservers appear to be in place along the upper canopy with securing straps properly installed. An additional life preserver appears forward of the jumpseat to the right of the operator. Passenger boarding begins at 1:38:27 elapsed time. Both rear and upper life ring are in place. The camera operator takes a seat in the outboard seat in the left bench on the fourth row.

The recording cuts to the safety briefing already in progress at 1:39:05 elapsed. The master is briefing passengers to keep arms and hands inside the vehicle at all times and that no smoking is allowed. The master points out the location of the forward and aft fire extinguishers. He is wearing non-tinted glasses.

At 1:39:21, the recording cuts in to the tour in progress in the Center City area of Philadelphia just after departure. The master is operating the vehicle while giving the tour. The recording stops and cuts in at several points along the route.

At 1:43:07, the recording cuts in as the DUKW approaches the boat ramp and does not cut out until after entering the river. At 1:43:55 elapsed, the master pulls a lever below and to his left, engaging the propeller. At 1:44:03, the master stops at the

top of the ramp to pick up a “duckhand.” The deckhand is wearing sunglasses. There is a small vessel similar in size to a ferry travelling southbound in the river. The windshield is down and all curtains are up. At 1:44:30, the master reaches forward and to his right in the area of the VHF radio. At 1:44:47, the vehicle enters the water. No security call from the master was heard. The master announces, “alright on the count of three you’re going to have to blow your quackers as loud as you can because we’re going out in the lanes of navigation.” The recording cuts away immediately, prior to entering the navigation channel.

At 1:46:07, the master talks about giving the tour while the deckhand operates the vehicle but the recording does not show the operator’s area. The recording cuts in at 1:46:13 and shows the master occupying the jumpseat giving the tour while the deckhand operates the vehicle. The master again reminds the passengers to keep hands and arms inside the DUKW.

At 1:46:39, the recording cuts in as the DUKW is travelling south approximately in line with the west Franklin Bridge tower passing the first pier north of Penn’s Landing.

At 1:47:14, the recording cuts in as the DUKW is travelling south, abeam the north end of Penn’s Landing. The Walt Whitman Bridge, approximately 2.5 nautical miles away, is visible. A dark spot similar to a vessel is visible under the center span of the Whitman Bridge.

At 1:47:34, the DUKW is heading east while turning to port and the camera is pointed north toward the Franklin Bridge. Another company DUKW is in sight approximately 50-100 feet northeast of the accident DUKW. The master tells the deckhand, “I want you to go out there. I told you about that. I want you further out. I don’t want to be up here. People don’t want to see this junk.”

At 1:48:08, the recording cuts in with the DUKW established northbound. At 1:48:13, the recording cuts in with the deckhand and master exchanging places. Background engine noise can no longer be heard. Thin, white smoke or steam is visible along the port side extending aft past the camera’s field of view. The smoke/steam is not heavy enough to obscure visibility. At 1:48:18, a sound similar to the port damper closing is heard. Smoke/steam is visible in the interior of the DUKW. At 1:48:22, the master reaches to his left with both hands, turns to his left and tugs three times, and a sound similar to the engine hood closing is heard. At 1:48:24, the master reaches down to his right, but the camera’s view to the area he is reaching is blocked. The deckhand is standing behind and to the right of the master facing forward. Laughing and conversation is heard from passengers.

At 1:48:28, the recording cuts to another DUKW boat travelling to the north away from the accident DUKW approximately 50-100 feet away. At 1:48:32, the deckhand is seen pulling himself through the windshield opening. Some passengers are standing while others remain seated. No more smoke/steam is visible. The DUKW’s bow is pointed east.

At 1:48:54, a passenger is heard to remark, “smells like burnt sugar,” while another remarks, “I think it smells like pretzels.” A child says, “burnt pretzels.” Everyone is seated except one man in a purple shirt standing behind the master facing forward. The DUKW’s bow is now pointed north. The master is still at the helm and the deckhand is standing on the starboard side of the bow decking.

At 1:49:08, the recording cuts to a shot showing the master sitting on the jumpseat and the deckhand seated on the port side of the engine hood. They appear to be conversing and the master is gesturing with his hands. The master's body is facing west with his head turned slightly north facing the deckhand. The deckhand's body is facing east with his head turned slightly south facing the master. The passengers are seated. Beginning at 1:49:15, the tape begins showing signs of damage and the recording ends at 1:49:19.

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