



National Transportation Safety Board

Marine Accident Brief

Grounding and Subsequent Breakup of Dive Vessel *King Neptune*

Accident no.	DCA15LM010
Vessel name	<i>King Neptune</i>
Accident type	Sinking
Location	Avalon Harbor, Catalina Island, California, about 40 nautical miles south-southwest of Los Angeles, California; 33°20.8' N, 118°19.6' W
Date	December 30, 2014
Time	2300 Pacific standard time (coordinated universal time – 8 hours)
Injuries	1 fatality
Property damage	Total loss of vessel, valued at \$1.5 million
Environmental damage	None reported
Weather	Overcast, rain squalls, northeast winds gusting to 39 knots, air temperature 40°F, water temperature about 60°F
Waterway information	Small, shallow bay on southeast Catalina Island

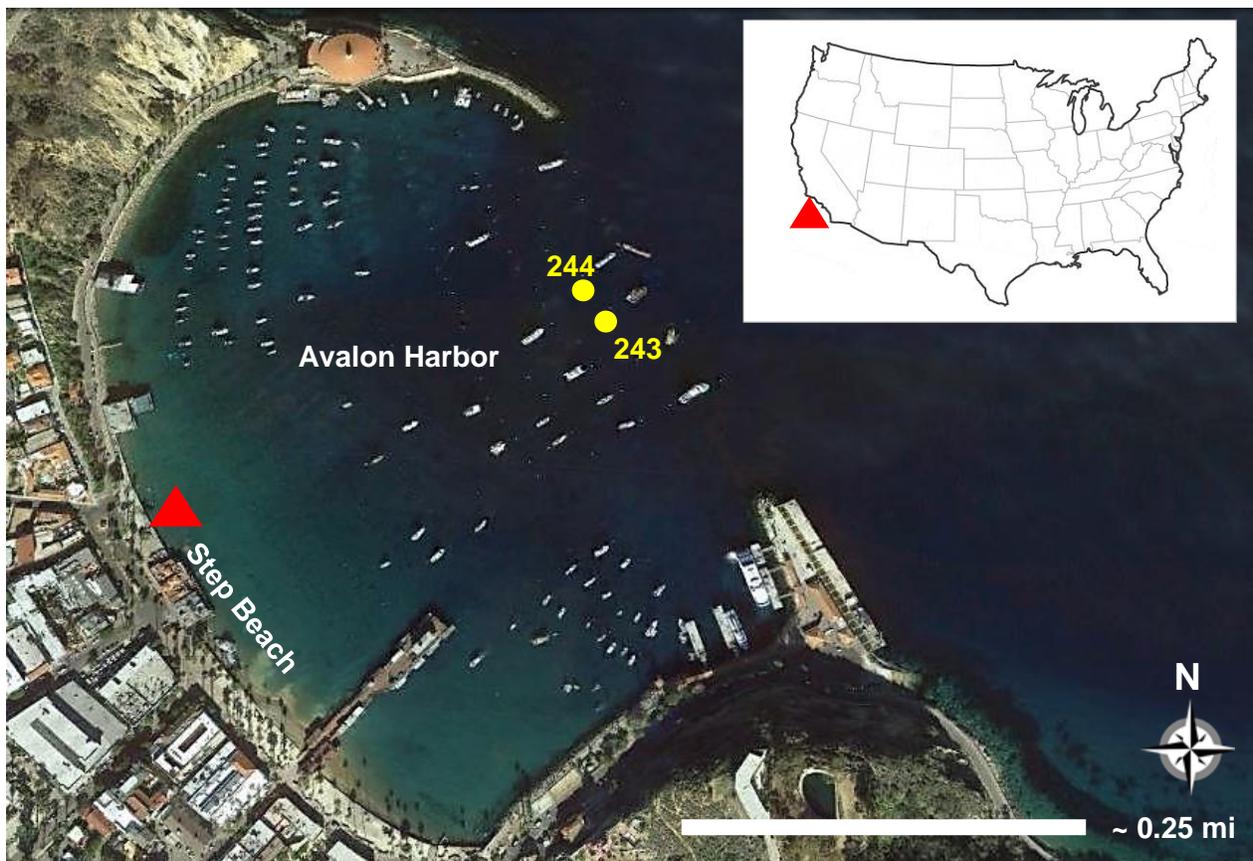
On the evening of December 30, 2014, in severe weather conditions, the 62-foot-long dive vessel *King Neptune* broke loose from its moorings in Avalon Harbor, Catalina Island, California. At the time, no one was on board. A harbor patrol officer, who later jumped on board the vessel to try to move it to a safe mooring location, died after falling into the water and becoming pinned between the vessel and a seawall. Under continuous wave action, the *King Neptune* broke apart and subsequently sank.



The *King Neptune*. (Photo provided by the vessel owner)

Grounding and Subsequent Breakup of Dive Vessel *King Neptune*

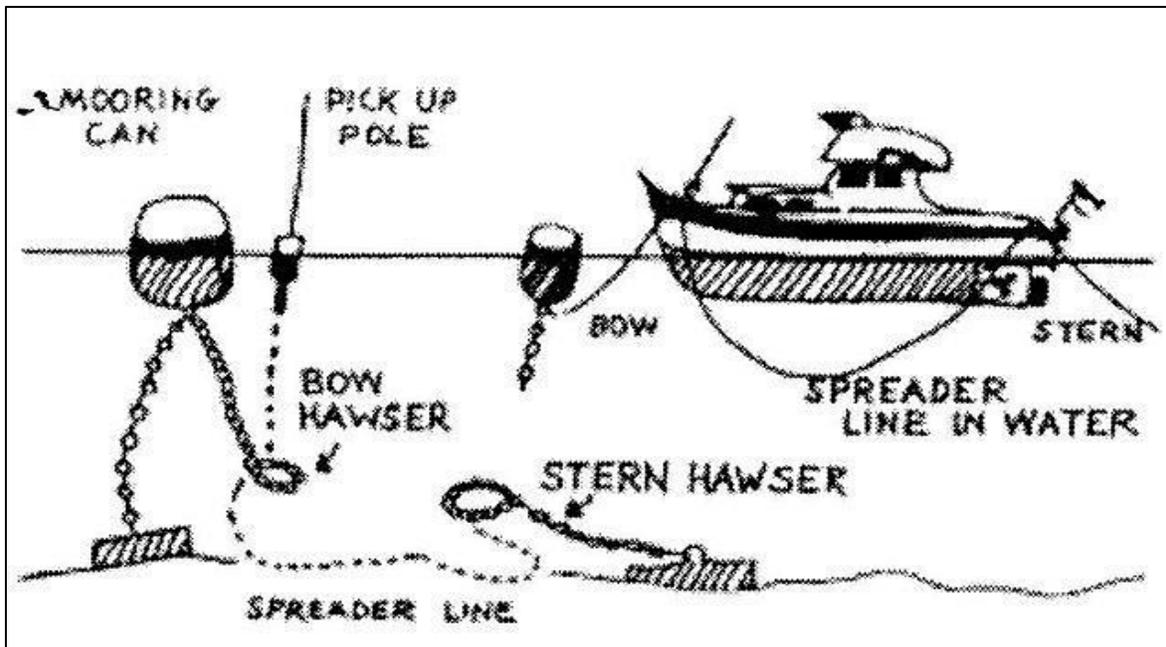
At 1412 on December 30, 2014, the National Weather Service issued a small craft advisory for the waters around Catalina Island. The winds were forecast to be initially from the north at 10 to 15 knots. The winds were to shift during the evening to the northeast and increase to 15 to 25 knots with gusts to 30 knots and seas at 5 to 7 feet. At the time the small craft advisory was issued, the dive vessel *King Neptune* was secured to mooring buoy no. 243 in Avalon Harbor. The Avalon Harbor Department, a city of Avalon government entity, assists boaters in mooring their vessels to the buoys, enforces usage rules and state and local regulations, maintains harbor structures and a fleet of patrol boats, and acts as first responders in emergencies. The Avalon Harbor Department is managed by a harbor master and staffed by about 20 full- or part-time employees.



Aerial view of Avalon Harbor. The approximate locations of mooring buoys 243 and 244 are overlaid by yellow dots. The approximate site of the patrol officer's death and the vessel breakup is marked by a red triangle. (Background by Google Earth)

The Avalon Harbor Department recommended that boaters moor their vessels by securing the loop (“eye”) of the harbor-provided 1-inch-diameter mooring line (“hawser”) to the deck of the vessels. According to a *King Neptune* deckhand, the crew varied this method by passing one of the vessel’s dock lines through the eye of the bow hawser (similar to “threading the eye of a needle”) and then securing the end of the dock line back onto the vessel. The stern was secured in a similar manner as the bow; that is, the harbor-recommended method was again varied by securing the vessel’s dock line to the deck of the vessel after the line was first passed through the stern hawser’s eye. Boaters would sometimes use this variation to facilitate releasing from, or letting go of, the moorings on departure.

Grounding and Subsequent Breakup of Dive Vessel *King Neptune*



Mooring arrangement similar to that used by the *King Neptune* on the day of the accident. (Diagram provided by the Avalon Harbor Department)

The *King Neptune* owner told investigators that, during the early afternoon of December 30, 2014, he and the vessel's part-time captain discussed the sufficiency of the vessel's moorings given the impending small craft advisory. They decided to increase the number of mooring lines and have the *King Neptune* remain in the harbor rather than put to sea or seek a more protected mooring location for the evening. The owner told investigators that the vessel had remained in the harbor during several previous small craft advisories without any problems.

About 1400, the part-time captain and the deckhand placed an additional bow line and stern line, in the same manner used at mooring buoy 243, to the adjacent hawsers at mooring buoy 244 and notified the owner. According to the deckhand, none of the vessel's dock lines had chafing gear (an expendable cover material placed around lines to prevent friction wear), and the places on the vessel to secure the bow lines were two cleats attached to the closed chocks. Closed chocks are openings in a vessel's side above the waterline that form a complete closed circle, allow the passage of lines, and reduce (but not eliminate) chafing. On the *King Neptune*, the closed chocks were built into the fiberglass hull. (The photo below shows a combination chock/cleat recovered from the *King Neptune* wreckage.)

Grounding and Subsequent Breakup of Dive Vessel *King Neptune*



A combination closed chock/cleat arrangement recovered from the bow of the *King Neptune*.

At 1500, the part-time captain reported for work at his second job as patrol officer with the Avalon Harbor Department. He was assigned to work that evening on board patrol boat 3, a 24-foot-long, 270-horsepower, single-propeller, center console vessel. Two other patrol officers were also on board patrol boat 3. The *King Neptune* part-time captain was assigned deckhand duties (so was one of the other two patrol officers) because he was not the most senior person on board that evening. According to numerous harbor patrol officers interviewed after the accident, the most senior person on board typically held the position of patrol boat captain.

Grounding and Subsequent Breakup of Dive Vessel *King Neptune*



Patrol boat 3 after the storm. Mooring buoys similar to the ones to which the *King Neptune* was secured can be seen in the background.

During the late afternoon, the winds were out of the northwest at 15 to 25 knots. The Avalon harbor master told investigators that, during that time, patrol officers prepared various harbor facilities for the approaching weather. During the early evening, the winds were still 15 to 25 knots but shifted to the northeast, impacting Avalon Harbor more directly. About 2100, an unpredicted formation of a secondary low pressure system, coupled with strong Santa Ana conditions (dry and strong down-slope winds from mainland California), caused the winds and seas to increase dramatically. According to the Avalon Harbor Department, between 2120 and 2220, six vessels broke loose from their moorings. About 2225, the *King Neptune* bow lines parted. The winds at that time were gusting to 39 knots and the seas were 10 to 14 feet (with a maximum possible height of 24 feet). Experienced harbor patrol officers later described the scene on the water as “chaotic,” “overwhelming,” “horrific,” and a “career storm.”

When the crewmembers on board patrol boat 3 learned that the *King Neptune* had broken loose, they promptly proceeded toward the dive vessel. While en route, the crew discussed which one of the two onboard deckhands would jump on board the *King Neptune* (this person was called the “jumper”). The part-time captain, who of the three patrol officers was the most familiar with the *King Neptune*, agreed to be the jumper. The discussed plan was for him to start the engines and, if necessary, take a tow line from the patrol boat so the *King Neptune* could be moved to a safe mooring location. According to the other patrol boat deckhand, when patrol boat 3 arrived, the *King Neptune* was still attached by its stern lines to the two mooring buoys. The jumper boarded the *King Neptune* but did not take a radio with him or establish a communication plan (beyond shouting in the howling winds to the other patrol officers). He went

Grounding and Subsequent Breakup of Dive Vessel *King Neptune*

below deck to start the engines but was unsuccessful in moving the *King Neptune*. Postaccident examination of the vessel's propellers and shaft showed them tightly wrapped with rope, which is consistent with the propellers turning under engine power.

The jumper next attached a tow line from patrol boat 3 to the *King Neptune* bow; however, the line parted when patrol boat 3 attempted to swing the *King Neptune* bow around. About this time, the *King Neptune* stern lines also parted from the mooring hawsers. Another harbor patrol boat, no. 7, which was identical in size and power to patrol boat 3, also tried to tow the *King Neptune*. However, its tow line parted and patrol boat 7 was then dispatched to aid another vessel. In addition to the two patrol boats, the larger and more powerful twin-propeller vessel *Baywatch Avalon* (operated by the Los Angeles County Fire Department) was nearby with the *King Neptune* owner on board. Ultimately, the owner and the *Baywatch Avalon* captain determined it was too risky to take the *King Neptune* under tow, and maneuvered away.

The *King Neptune* continued to drift in the harbor and approached the dangerous breakers, or surf zone, closer to shore. The two patrol officers on board patrol boat 3 and the jumper on board the *King Neptune* decided to make a final attempt at towing the vessel. This time, the jumper attached the tow line to the *King Neptune* stern. Patrol boat 3 began to tow the *King Neptune*, but the senior patrol officer (the patrol boat captain) believed the patrol boat was about to capsize in the large and closely spaced waves. As a result, the senior patrol officer ordered the tow line cut, maneuvered the patrol boat away from the *King Neptune*, and proceeded to aid other vessels. Neither he nor the other patrol officer informed the harbor master's office that one of their crewmembers was on board the *King Neptune*. About 2245, with fouled propeller shafts and no possibility of a tow, the *King Neptune* drifted into the 10- to 12-foot breaking surf near the shore.

Two onshore sheriff deputies, who were tending to a beached vessel at Step Beach, rushed toward the nearby seawall where the *King Neptune* was about to strike. About 2250, the two deputies tried to guide the jumper as he attempted to jump from the vessel onto the seawall. However, he mistimed his jump and landed in the raging surf between the vessel and the seawall. Moments later, he was pinned against the seawall by the surging vessel and died as a result of his injuries.

All that remained of the *King Neptune* after a night of constant pounding against the seawall was a partially submerged hull and engines. Vessel debris was strewn about the harbor bottom, shoreline, and road near Step Beach. The vessel was a constructive total loss.

Grounding and Subsequent Breakup of Dive Vessel *King Neptune*



Beached wreckage of the *King Neptune*.

Although vessels in Avalon Harbor had previously broken their moorings during inclement weather, neither the city of Avalon harbor regulations nor the Avalon harbor master had any specific guidance addressing safe mooring in inclement weather or the use of chafing gear on mooring lines. A postaccident inspection of mooring buoys 243 and 244, to which the *King Neptune* was moored, found the hawsers intact and the anchors in position. The *King Neptune* crew modified the recommended mooring arrangement by using the vessel's own dock lines to make fast (attach) to the provided mooring hawsers. The harbor master told investigators he was aware that some people used their own lines to tie up to the moorings so that the vessels could let go easily on departure. However, he also stated that no requirements or specifications existed to ensure that the lines used were of equal or greater strength than the provided mooring hawsers. Although it could not be determined whether the *King Neptune* mooring lines parted or the entire bow ground tackle (plate to which mooring equipment was attached) broke away, the failure occurred somewhere in the vessel's own mooring equipment.

In addition, the patrol boats responding to the emergency were of inadequate size and power to effectively tow the *King Neptune*. Witness statements questioned the feasibility of a much smaller harbor patrol boat towing a much larger vessel in severe weather conditions; one patrol boat captain believed "having any luck" towing the *King Neptune* was a "fantasy." Nevertheless, attempts were made to tow the *King Neptune* "because towing [other] vessels was what we [patrol boats] were sent to do." Finally, although anchors are often used to slow or arrest a vessel's drift, the *King Neptune* anchor was not deployed during the emergency.

Grounding and Subsequent Breakup of Dive Vessel *King Neptune*

As part of their duties with the Avalon Harbor Department, patrol officers were expected to jump from one vessel to another, tow and maneuver vessels in emergency situations, assist in securing boats to moorings, and respond to emergencies in all weather conditions. However, no guidelines or formal training had been established regarding how to determine if a particular jump between vessels was safe, whether a patrol boat could tow a much larger and heavier vessel in high winds and rough seas, how to tow a vessel in severe weather conditions, or when and how to retrieve a harbor patrol officer from a vessel in severe weather conditions. During the December 30 storm, a patrol officer jumped on board the *King Neptune* in dangerous conditions with no plan to retrieve him should the attempt to maneuver the vessel fail. Further, no one shoreside was aware that he boarded the *King Neptune* because no established protocol was in place to notify the harbor master's office when a patrol officer jumped on board another vessel, and none of the other patrol officers chose to report it. Finally, the patrol officer took no communication equipment with him when he jumped onto the *King Neptune*; therefore, he could not relay the grave situation he was in.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the breakup and subsequent sinking of the *King Neptune* was the failure of the vessel's mooring equipment in severe weather conditions and the Avalon Harbor Department's inability to prevent the vessel from drifting ashore. Contributing to the death of the patrol officer who jumped on board was the Avalon Harbor Department's decision to allow personnel to board a drifting vessel in severe weather conditions without a plan for communication and retrieval.

Grounding and Subsequent Breakup of Dive Vessel *King Neptune*

Vessel Particulars

Vessel	<i>King Neptune</i>
Owner/operator	Island Charters Inc.
Port of registry	Avalon, California
Flag	United States
Type	Small passenger vessel
Year built	1978; Westport, Washington
Official number (US)	592227
Construction	Fiberglass
Length	62.1 ft (18.9 m)
Depth	8 ft (2.44 m)
Beam/width	19.1 ft (5.82 m)
Gross and/or ITC tonnage	72 gross tons
Engine power; manufacturer	2 diesel main engines, 1,000 hp total (745 kW)
Persons on board	1

For more details about this accident, visit www.nts.gov and search for NTSB accident ID DCA15LM010.

Adopted: October 27, 2015

NTSB investigators worked closely with our counterparts from Coast Guard Station Los Angeles/ Long Beach throughout this investigation.

The NTSB has authority to investigate and establish the probable cause of any major marine casualty or any marine casualty involving both public and nonpublic vessels under Title 49 *United States Code*, 1131. This report is based on factual information either gathered by NTSB investigators or provided by the Coast Guard from its informal investigation of the accident.

The NTSB does not assign fault or blame for a marine casualty; rather, as specified by NTSB regulation, “[NTSB] investigations are fact-finding proceedings with no formal issues and no adverse parties . . . and are not conducted for the purpose of determining the rights or liabilities of any person.” Title 49 *Code of Federal Regulations*, 831.4.

Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by conducting investigations and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report. Title 49 *United States Code*, 1154(b).
