



## ***FINDINGS OF CONCERN***

### **Sector Boston**

June 28, 2019  
Boston, Massachusetts

Findings of Concern 010-19

## **RECREATIONAL SCALLOP DIVING HAZARDS**

Purpose. The U.S. Coast Guard issues findings of concern to disseminate information related to unsafe conditions that were identified as causal factors in a casualty and could contribute to future incidents. Findings of concern are intended to educate the public, state, or local agencies about the conditions discovered so they may address the findings with an appropriate voluntary action or highlight existing applicable company policies or state/local regulations.

The Incident. Sector Boston investigated a recreational diving fatality that occurred on a scallop dive charter on October 20, 2018, approximately one mile south of Nahant, MA, in Broad Sound. Three recreational divers were on the charter and one of the divers failed to surface after the first scallop dive. The dive charter Captain noticed the missing diver's flag buoy had disappeared below the surface of the water shortly before the first diver surfaced. The Captain observed air bubbles coming up where the flag had gone under, but after picking up the first diver, he returned to the location and there were no air bubbles. The second diver surfaced and there was still no sign of the missing diver, so the dive charter Captain notified the Coast Guard. A surface search yielded no results and, while waiting for rescue divers to arrive, the two recreational divers went back in the water to search. They located the diver on the ocean floor, unresponsive, with no air in his tank. The diver had tied off his bag of scallops to the dive line, which indicated that he had finished collecting scallops and would typically precede a diver's ascent to the surface. The dive line was tangled near the diver and the reel for the dive line was wrapped back around the line above the diver's head. The diver was brought to the surface and transported to a local pier where he was pronounced deceased.

Contributing Factors and Analysis. The investigation identified several contributing factors to the incident. These included the diver's inexperience diving in Massachusetts waters and diving for scallops, inadequate assessment of diver certifications and experience prior to the dive, inexperience using a dive flag buoy, high rate of air consumption by the diver, and entanglement in the dive line.

Recreational scallop diving in Massachusetts waters presents challenging conditions, including cold water temperatures (typically ranging from 40-60° F), depths of 70+ feet, strong currents, and low visibility. The maximum depth recommended by recreational diver certification agencies for Open Water certified divers is 60 feet and for Advanced Open Water it is 100 feet. The diver in this case was Open Water certified, completed over 50 dives, had cold water experience, and needed two more logged dives and two more specialty courses to obtain his Advanced Open Water certification. The diver had conducted 100-foot dives in warm water and better visibility; however, this was the deepest dive he had attempted in cold water. The dive

charter Captain evaluated the diver's overall experience prior to the charter and found it suitable to conduct the scallop dive, despite not having the Advanced Open Water certification.

Dive flags are required by Massachusetts law and serve to alert boaters of divers in the area. When scallop diving, divers use an individual dive flag buoy attached to a line on a reel (see Figure 1). The dive flag buoy floats on the surface and the diver pays out the line from the reel while descending. Once on the ocean floor, the diver uses a mesh catch bag to collect scallops while keeping the dive flag reel in hand and towing the buoy to mark their location. When finished collecting scallops, the diver ties off the catch bag to the dive line and ascends along the line to the surface. The dive flag line and catch bag are hauled up using the vessel's pot hauler after the diver has returned to the vessel. Although dive flags are used for diver safety, they can also present risks, particularly to divers that are inexperienced with their use. Towing the flag while collecting scallops can lead to overexertion. The scallop bags become heavier as they fill up which can make it challenging to maintain neutral buoyancy and may lead to increased fatigue. The dive line can also present an entanglement hazard, particularly in strong currents.



Figure 1. Dive flag buoy and reel with line used by divers on scallop dive charter

A typical scallop dive is approximately 25-30 minutes long and divers usually dive with a 2,500 pounds per square inch (psi) capacity air tank. The diver was known to consume air at a higher than average rate, and in this case, dive computer data indicated the diver ran out of air within 20 minutes. The data also revealed the diver made two separate attempts to ascend, coming within seven feet of the surface on his second attempt before running out of air. Both ascents were recorded at rates faster than diver certification agency's recommended rate of 30 feet per minute. It is likely that the diver was rushing as his air supply was getting lower and he struggled with dive line entanglement.

Findings of Concern. The following findings list the hazards and mitigations associated with recreational scallop diving with the goal of promoting awareness and preventing further incidents:

- **Scallop Diving Conditions:** Recreational scallop divers should have experience diving in cold water temperatures at the depths associated with the planned dives. Divers should also be comfortable diving in low visibility conditions with strong currents. It is recommended that dive charter operators verify the diver's experience with these conditions prior to booking a charter.
- **Diving Certifications and Experience:** It is recommended that recreational divers have their Advanced Open Water certification when a planned dive exceeds 60 feet. Divers and dive charter operators should be extremely cautious in substituting overall diving experience for experience specific to an activity such as scallop diving. When challenging environmental conditions such as depth, temperature, visibility, and currents combine with performing an unfamiliar activity, a diver can quickly become overwhelmed and find themselves in a hazardous situation.
- **Dive Flag Buoys:** The entanglement risk posed by dive flag buoys can be mitigated by carriage of a dive knife. In addition to carrying a dive knife, it is also recommended that divers have experience using a dive flag buoy prior to scallop diving.
- **Buddy Diving:** Although low visibility conditions and difficulty staying together lead most scallop divers to dive solo, having an experienced buddy diver could mitigate several of the risks associated with scallop diving. A buddy diver can provide timely assistance with buoyancy, air supply, and entanglement issues. It is recommended that divers and dive charter operators implement a buddy diving system, particularly when there is a less-experienced diver on a charter.
- **Air Consumption Rate:** Divers should be aware of the impacts that scallop diving conditions may have on air consumption rates, especially for those who tend to go through air quickly. Management of air supply should be discussed between divers and dive charter operators, especially given the depth and additional exertion factors associated with activities such as scallop diving. Divers can also mitigate this risk with use of larger air tanks or by carrying an emergency source of air.

Closing. These findings of concern are provided for informational purpose only and do not relieve any domestic or international safety, operational, or material requirements. For any questions or comments, please contact Sector Boston Investigations Division by phone at (617) 557-9081 or by email at [BostonIO@uscg.mil](mailto:BostonIO@uscg.mil).