

Fire Aboard Small Passenger Vessel *Conception*
Platts Harbor, Channel Islands National Park,
Santa Cruz Island, 21.5 miles South-Southwest of
Santa Barbara, California
September 2, 2019



Marine Accident Report

NTSB/MAR-20/03
PB2020-101011



National
Transportation
Safety Board

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490 L'Enfant Plaza SW
Washington, DC 20594

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Abstract: This report discusses the September 2, 2019, fire on board the 75-foot-long small passenger vessel *Conception*, operated by Truth Aquatics, Inc., in Platts Harbor on the north side of Santa Cruz Island, 21.5 nautical miles south-southwest of Santa Barbara, California. Thirty-three passengers and one crewmember died. Safety issues identified in this report include the lack of small passenger vessel regulations requiring smoke detection in all accommodation spaces, the lack of a roving patrol, small passenger vessel construction regulations for means of escape, and ineffective company oversight. As part of its accident investigation, the National Transportation Safety Board makes ten new safety recommendations to the US Coast Guard, associations that have members operating small passenger vessels with overnight accommodations, and Truth Aquatics, Inc.; the NTSB reiterates one safety recommendation to the Coast Guard.

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Acronyms and Abbreviations

AC	alternating current
AIS	automatic identification system
ATF	Bureau of Alcohol, Tobacco, Firearms and Explosives
cfm	cubic feet per minute
<i>CFR</i>	<i>Code of Federal Regulations</i>
COI	Certificate of Inspection
CPR	cardiopulmonary resuscitation
DC	direct current
EMT	emergency medical technician
FBI	Federal Bureau of Investigation
FRP	fiberglass-reinforced plastic
GPS	global positioning system
hp	horsepower
mph	miles per hour
MSD	Marine Safety Detachment
MSIB	Marine Safety Information Bulletin
NAVTEX	Navigational Telex
NBVC	Naval Base Ventura County
NTSB	National Transportation Safety Board
OCMI	Officer in Charge, Marine Inspection
OSC	on-scene coordinator
POB	persons on board
RB-M	response boat-medium
SCC	sector command center
SMS	safety management system
UMIB	Urgent Marine Information Broadcast
VCFD	Ventura County Fire Department
VHF	very high frequency

Executive Summary

Accident

About 0314 Pacific daylight time on September 2, 2019, the US Coast Guard received a distress call from the *Conception*, a 75-foot-long small passenger vessel operated by Truth Aquatics, Inc. The vessel was anchored in Platts Harbor on the north side of Santa Cruz Island, 21.5 nautical miles south-southwest of Santa Barbara, California, when it caught fire. When the fire started, 5 crewmembers were asleep in their bunks in the crew berthing on the upper deck, and 1 crewmember and all 33 passengers were asleep in the bunkroom below. A crewmember sleeping in an upper deck berth was awakened by a noise and got up to investigate. He saw a “glow” outside. Realizing that there was a fire rising up from the salon compartment directly below, the crewmember alerted the four other crewmembers sleeping on the upper deck.

The captain was able to radio a quick distress message to the Coast Guard. Crewmembers jumped down to the main deck and attempted to access the salon to assist the passengers and crewmember in a bunkroom below the main deck but were blocked by fire and overwhelmed by thick smoke. The five surviving crewmembers jumped overboard. Two crewmembers swam to the stern, re-boarded the vessel, and found the access to the salon through the aft corridor was also blocked by fire, so, along with the captain who also had swum to the stern, they launched the vessel’s skiff and picked up the remaining two crewmembers in the water. The crew transferred to a recreational vessel anchored nearby where the captain continued to radio for help, while two crewmembers returned to the waters around the burning *Conception* to search for possible survivors.

The Coast Guard and other first responder boats began arriving on scene at 0427. Despite firefighting and search and rescue efforts, the vessel burned to the waterline and sank just after daybreak, and no survivors were found. Thirty-three passengers and one crewmember died. The surviving crew were transported to shore, and two were treated for injuries. Loss of the vessel was estimated at \$1.4 million.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the accident on board the small passenger vessel *Conception* was the failure of Truth Aquatics, Inc., to provide effective oversight of its vessel and crewmember operations, including requirements to ensure that a roving patrol was maintained, which allowed a fire of unknown cause to grow, undetected, in the vicinity of the aft salon on the main deck. Contributing to the undetected growth of the fire was the lack of a United States Coast Guard regulatory requirement for smoke detection in all accommodation spaces. Contributing to the high loss of life were the inadequate emergency escape arrangements from the vessel’s bunkroom, as both exited into a compartment that was engulfed in fire, thereby preventing escape.

Investigative Constraints

The Office of the US Attorney is conducting a criminal investigation of this accident. The Assistant US Attorney assigned to the case requested the National Transportation Safety Board (NTSB) not interview the captain of the *Conception* out of concern that the interview could hinder the ability of their office to bring criminal charges against the captain. The NTSB obtained significant information from the other crewmembers; however, the *Conception*’s captain had many

years of experience on the same vessel, so the owner and surviving crewmembers referred many of investigators' questions to the captain, which remain unanswered. The Office of the US Attorney also requested that NTSB investigators not interview the first galley hand, who was hospitalized at the time, or any Truth Aquatics employee responsible for operations.

From September 8 to 10, 2019, the Office of the US Attorney served search warrants on the offices and two remaining vessels of Truth Aquatics; the NTSB was not invited to participate. The search warrants resulted in the seizure of thousands of pages of documents and records. Computers, security camera servers, and items such as fans, smoke detectors, and heat sensors from each vessel were also seized. Truth Aquatics was not able to provide records or information to NTSB investigators after the search warrants were executed. Scans of the seized documents and records were not provided to NTSB investigators until February 2020, and no electronic evidence recovered from computers and servers was included in the materials provided.

These impediments delayed and complicated the NTSB's investigation, but they did not affect its quality, as investigators used the factual information collected to complete an accurate, safety-focused investigation (see [Appendix A](#) for more details on the investigation).

Safety Issues

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

- [Lack of small passenger vessel regulations requiring smoke detection in all accommodation spaces.](#) In accordance with the fire safety regulations applicable to the *Conception* in Title 46 *Code of Federal Regulations* Subchapter T, the only compartment that was required to be fitted with smoke detectors was the passenger bunkroom, since it was the vessel's only overnight accommodation space.¹ The *Conception* was equipped with two modular smoke detectors in the bunkroom—one mounted on the overhead of each of the port and starboard aisles. The *Conception* had no smoke detectors anywhere in the main deck salon area where crewmembers reported seeing the fire. The nearest heat detector was well forward in the galley, a deck above the bunkroom, and was not intended to be utilized as a fire detector for the entire salon. Additionally, all detectors aboard the vessel only sounded locally. Although the *Conception* met the regulatory compliance for smoke detectors in the bunkroom where the passengers and crewmember slept, the fire above them in the salon would have been well developed before the smoke activated these detectors.
- [Lack of a roving patrol.](#) NTSB investigators found that, prior to the accident, the *Conception* and other Truth Aquatics vessels were regularly operating in contravention of the regulations and the vessel's Certificate of Inspection, which required a roving patrol at night and while passengers were in their bunks to guard against, and give alarm in case of, a fire, man overboard, or other dangerous situation. During the investigation, NTSB staff visited other dive boats operating from Southern California ports and harbors and spoke with their owners/operators. During informal discussions, all owners/operators stated that night patrols were assigned whenever passengers were aboard, but the procedures for the patrols varied greatly. When asked by investigators, Coast Guard inspectors stated that they

¹ According to Title 46 *Code of Federal Regulations* 175.400, accommodation spaces include those spaces used as a public space, dining room or mess room, lounge or café; overnight accommodation space; or washroom or toilet space. On board the *Conception*, the accommodation spaces included the salon, bunkroom, and shower room.

could not verify compliance with the roving patrol requirement, since inspections were not conducted during overnight voyages with passengers embarked.

- **Small passenger vessel construction regulations for means of escape.** The *Conception* was designed in accordance with the regulations in Subchapter T in force at the time of construction. As such, the vessel was required to have at least two emergency egress pathways from all areas accessible to passengers. The *Conception* had two means of escape from the bunkroom: spiral stairs forward and an escape hatch aft, accessible from either port or starboard aisles by climbing into one of the top aftermost inboard bunks. However, both paths led to the salon, which was filled with heavy smoke and fire, and the salon compartment was the only escape path to exterior (weather) decks. Therefore, because there was fire in the salon, the passengers were trapped, and the crew was not able to reach them. If regulations had required the escape hatch to exit to a space other than the salon, optimally directly to the weather deck, the passengers and crewmember in the bunkroom would have likely been able to escape.
- **Ineffective company oversight.** During the investigation, the NTSB found several unsafe practices on company vessels, including a lack of crew training, emergency drills, and the roving patrol. In reviewing the company's policies and procedures, along with the Coast Guard regulations, it is clear that Truth Aquatics had been deviating from required safe practices for some time. If the company had been actively involved in ensuring the safe practices required by regulations were enforced, most notably the requirement for a roving patrol, it is likely this accident would have not happened. Had a safety management system been in place at Truth Aquatics, it would have likely included procedures for roving patrols that complied with regulations and a company-involved audit process for identifying and correcting when non-conformities with the patrol requirements existed.

Findings

1. Weather and sea conditions were not factors in the accident.
2. The use of alcohol or other tested-for drugs by the *Conception* deck crew was not a factor in the accident.
3. The origin of the fire on the *Conception* was likely inside the aft portion of the salon.
4. Although a definitive ignition source cannot be determined, the most likely ignition sources include the electrical distribution system of the vessel, unattended batteries being charged, improperly discarded smoking materials, or another undetermined ignition source.
5. The exact timing of the ignition cannot be determined.
6. Most of the victims were awake but could not escape the bunkroom before all were overcome by smoke inhalation.
7. The fire in the salon on the main deck would have been well developed before the smoke activated the smoke detectors in the bunkroom.
8. Although the arrangement of detectors aboard the *Conception* met regulatory requirements, the lack of smoke detectors in the salon delayed detection and allowed for the growth of the fire, precluded firefighting and evacuation efforts, and directly led to the high number of fatalities in the accident.

9. [Interconnected smoke detectors in all accommodation spaces on Subchapter T and Subchapter K vessels would increase the chance that fires will be detected early enough to allow for successful firefighting and the evacuation of passengers and crew.](#)
10. [The absence of the required roving patrol on the *Conception* delayed detection and allowed for the growth of the fire, precluded firefighting and evacuation efforts, and directly led to the high number of fatalities in the accident.](#)
11. [The US Coast Guard does not have an effective means of verifying compliance with roving patrol requirements for small passenger vessels.](#)
12. [The *Conception* bunkroom's emergency escape arrangements were inadequate because both means of escape led to the same space, which was obstructed by a well-developed fire.](#)
13. [Subchapter T regulations \(Old and New\) are not adequate because they allow for primary and secondary means of escape to exit into the same space, which could result in those paths being blocked by a single hazard.](#)
14. [Although designed in accordance with the applicable regulations, the effectiveness of the *Conception*'s bunkroom escape hatch as a means of escape was diminished by the location of bunks immediately under the hatch.](#)
15. [The emergency response by the Coast Guard and municipal responders to the accident was appropriate but was unable to prevent the loss of life given the rapid growth of the fire at the time of detection and location of the *Conception*.](#)
16. [Truth Aquatics provided ineffective oversight of its vessels' operations, which jeopardized the safety of crewmembers and passengers.](#)
17. [Had a safety management system been implemented, Truth Aquatics could have identified unsafe practices and fire risks on the *Conception* and taken corrective action before the accident occurred.](#)
18. [Implementing safety management systems on all domestic passenger vessels would further enhance operators' ability to achieve a higher standard of safety.](#)

Recommendations

New Recommendations

As a result of its investigation of this accident, the NTSB makes the following ten new safety recommendations:

To the US Coast Guard

[Revise Title 46 Code of Federal Regulations Subchapter T to require that newly constructed vessels with overnight accommodations have smoke detectors in all accommodation spaces. \(M-20-14\)](#)

[Revise Title 46 Code of Federal Regulations Subchapter T to require that all vessels with overnight accommodations currently in service, including those constructed prior to 1996, have smoke detectors in all accommodation spaces. \(M-20-15\)](#)

[Revise Title 46 Code of Federal Regulations Subchapter T and Subchapter K to require all vessels with overnight accommodations, including vessels constructed](#)

prior to 1996, have interconnected smoke detectors, such that when one detector alarms, the remaining detectors also alarm. (M-20-16)

Develop and implement an inspection procedure to verify that small passenger vessel owners, operators, and charterers are conducting roving patrols as required by Title 46 Code of Federal Regulations Subchapter T. (M-20-17)

Revise Title 46 Code of Federal Regulations Subchapter T to require newly constructed small passenger vessels with overnight accommodations to provide a secondary means of escape into a different space than the primary exit so that a single fire should not affect both escape paths. (M-20-18)

Revise Title 46 Code of Federal Regulations Subchapter T to require all small passenger vessels with overnight accommodations, including those constructed prior to 1996, to provide a secondary means of escape into a different space than the primary exit so that a single fire should not affect both escape paths. (M-20-19)

Review the suitability of Title 46 Code of Federal Regulations Subchapter T regulations regarding means of escape to ensure there are no obstructions to egress on small passenger vessels constructed prior to 1996 and modify regulations accordingly. (M-20-20)

To the Passenger Vessel Association, Sportfishing Association of California, and National Association of Charterboat Operators

Until the US Coast Guard requires all passenger vessels with overnight accommodations, including vessels constructed prior to 1996, to have smoke detectors in all accommodation spaces, share the circumstances of the *Conception* accident with your members and encourage your members to voluntarily install interconnected smoke and fire detectors in all accommodation spaces such that when one detector alarms, the remaining detectors also alarm. (M-20-21)

Until the US Coast Guard requires small passenger vessels with overnight accommodations to provide a secondary means of escape into a different space than the primary exit, share the circumstances of the *Conception* accident with your members and encourage your members to voluntarily do so. (M-20-22)

To Truth Aquatics, Inc.

Implement a safety management system for your fleet to improve safety practices and minimize risk. (M-20-23)

Recommendation Reiterated in this Report

As a result of its investigation of this accident, the NTSB reiterates Safety Recommendation M-12-3, which is currently classified as “Open—Unacceptable Response”:

To the US Coast Guard

Require all operators of U.S.-flag passenger vessels to implement SMS, taking into account the characteristics, methods of operation, and nature of service of these vessels, and, with respect to ferries, the sizes of the ferry systems within which the vessels operate. (M-12-3)

1 Factual Information

1.1 Background



Figure 1. Pre-accident photograph of the *Conception*. (Source: www.seawayboats.net)

Owned by the Fritzler Family Trust and operated by Truth Aquatics, Inc. (hereafter referred to as Truth Aquatics), the 75-foot-long small passenger vessel *Conception* was constructed in 1981 by Seaway Boats, Inc, in Long Beach, California. The dive vessel was purpose-built to take recreational divers on one-day and overnight trips to dive sites around the Channel Islands. The *Conception* was constructed of fiberglass laid over plywood and had three decks: the upper deck, main deck, and below deck.

Vessel particulars of the *Conception* were as follows:

Length:	75 feet
Beam:	26 feet
Draft:	4 feet
Tonnage:	97 gross register tons
Crew:	6
Passenger capacity:	99 (or 46 overnight passengers)
Engine:	Two 550-horsepower (hp), 2-stroke, turbo-charged, 92 series, V8 Detroit Diesel engines



Figure 2. Port side of the *Conception's* salon looking aft. (Source: M. Ryan)

The *Conception's* main deck ran the full length of the vessel, with exterior (open) decks and an enclosed salon and galley.² The salon had food service counters along the centerline and fixed dining tables on either side. Installed benches along the port and starboard bulkheads provided seating outboard of the tables, and plastic (outdoor-type) chairs provided seating inboard of the tables. The galley was forward of the seating area. The center window of three windows on the forward bulkhead of the galley could be opened from the inside by turning a hand screw and pushing the window outward at the bottom, since it was hinged at the top. On the forward starboard side of the salon, two sets of spiral stairways led down below to a shower room (forward) and a bunkroom (aft). Doors at the aft end of the salon opened to a large, open aft deck. According to the owner, the doors were always kept open when passengers were on board. There were no other doors to the exterior from the salon.

² During interviews, the crew of the *Conception* referred to the entire salon and galley space as the “galley.” For clarity, this report will refer to the full space as the “salon,” unless specifically referring to the food preparation area.

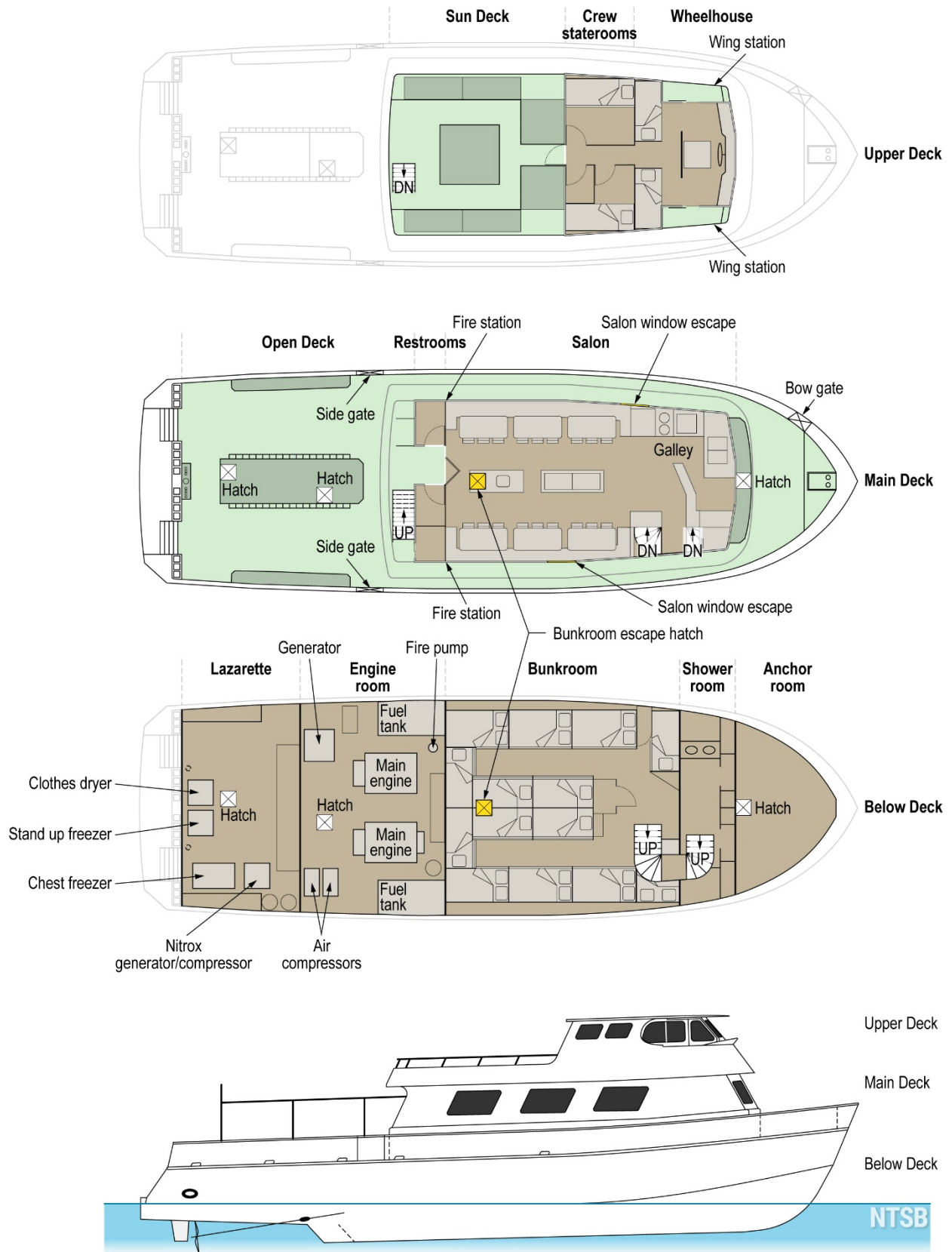


Figure 3. Conception simple plan and profile views.

Three small restrooms, each with a single toilet and a small sink, were located just aft of the salon. Aft of the portside restroom door, a sign posted on the bulkhead identified the location as the muster area. Exterior walkways on either side of the salon and restrooms extended from the bow to the aft open deck. Fire hose stations were located on both port and starboard walkways adjacent to the restrooms (see [figure 30](#) for the location of all firefighting equipment and lifesaving appliances).

The open deck aft of the salon had a raised platform centerline with racks on either side for storing scuba tanks and other gear. The raised platform also contained hatches for accessing the engine room (forward) and lazarette (aft).³ On the stern of the vessel, a large swim platform accessible by stairs from the open deck was raised and lowered using an electrically powered hydraulic winch. When in the raised position, the metal swim platform served as a cradle for a small outboard-powered inflatable skiff.



Figure 4. Aft main deck of the *Conception* during a previous voyage. (Source: Profundo no Mundo, YouTube, annotated by NTSB)

Below the main deck, the vessel was divided into four compartments. The forwardmost space was an anchor room that was accessible via a small hatch on the forward weather deck. The shower room was aft of the anchor room, followed by the bunkroom. The bunkroom contained 33 bunks, arranged around 2 aisles, with bunks on either side of each aisle ([figure 5](#)). Twelve double bunks, which allowed two people to sleep in the same bunk, were stacked two-high and located on the outside of the aisles. One additional double bunk was located underneath the forward stairway on the starboard side. The remaining 20 bunks were single bunks, with 4 sets of bunks

³ A vessel's *lazarette* is its aftermost compartment below the main deck, typically accessed by a deck hatch.

stacked three-high arranged along the centerline, and 2 sets arranged athwartship (across the ship from side to side) along the aft bulkhead. A two-high set of single bunks was located along the forward bulkhead on the port side (the upper bunk was reserved for a crewmember). The maximum occupancy of the bunkroom was 46 persons. Each of the bunks had a privacy curtain that could be pulled fully across the aisle-accessible side of the bunks.

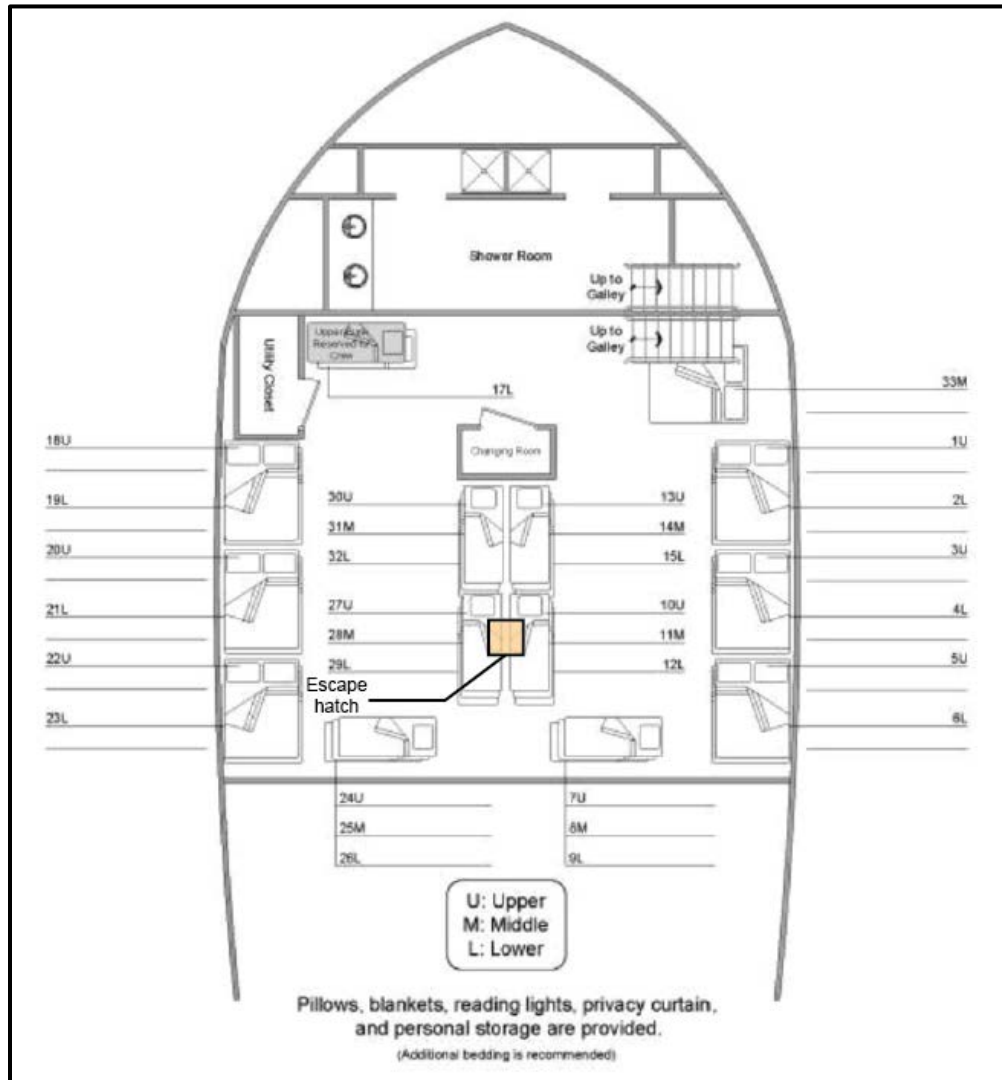


Figure 5. *Conception* bunkroom arrangement, with escape hatch location added by NTSB. (Source: Truth Aquatics; annotated by NTSB)

An escape hatch provided an alternate means of exiting the bunkroom (the stairway at the forward end was the primary means). The escape hatch, which consisted of a removable wooden panel that was about 22 inches by 22 inches in size, was located in the overhead between the aftmost centerline bunks.⁴ It could be reached from either aisle by climbing a wooden ladder installed on the side of each centerline aft set of bunks. The hatch exited into the aft end of the

⁴ The measurements for the escape hatch are from Truth Aquatics’ similar vessel, the *Vision*, which was built from the design of the *Conception*. There was no difference in the design of the escape hatch between both vessels.

salon, and thus both escape routes from the bunkroom exited into the salon. The upper bunks nearest the emergency escape hatch had passengers assigned to them during the accident voyage.



Figure 6. Photo left is the escape hatch, viewed from the bunkroom, on the *Vision*, a Truth Aquatics dive vessel with arrangements nearly the same as the *Conception*. (Source: NTSB) Photo right, taken during a previous voyage, shows the escape hatch, viewed from aft in the salon, on the *Conception*. (Source: J. Palmer, annotated by NTSB)

A watertight bulkhead divided the bunkroom from the engine room, which contained the vessel's two main propulsion engines and a single electrical generator. Fuel tanks that supplied the engines and generator were located forward in the engine room, outboard of each of the main propulsion engines. The generator was located aft of the port main propulsion engine. Two air compressors used for filling scuba diving tanks were mounted aft of the starboard main propulsion engine. A 40-gallon, 220-volt electric hot water heater was located in the engine room forward of the starboard main engine.

The lazarette was the aftmost space below the main deck and contained the steering gear for two rudders, a refrigerator/freezer for storing seafood caught during dives, a clothes dryer, and a generator/compressor for enriched-oxygen air—commonly referred to as nitrox—used in diving.⁵ The generator produced nitrox on demand and did not store the compressed gas within the system. (Compressed air and nitrox were stored only in scuba tanks brought on board by

⁵ *Nitrox*, with respect to underwater diving, is an air mixture composed of nitrogen and an elevated percentage of oxygen (when compared to atmospheric air). It is created by passing compressed air through a semi-permeable membrane, which removes a portion of nitrogen, thus increasing the amount by volume of oxygen in the resultant air mixture. Typical oxygen percentages used in recreational diving are 32 and 36 percent by volume. Using nitrox-enriched oxygen air while diving is advantageous because the diver is exposed to less nitrogen and its negative effects. Divers aboard the *Conception* paid an extra fee in order to be supplied with nitrox.

passengers and secured in the outer main deck racks.) In addition to the mechanical equipment, wet suits were dried and stored in the lazarette.

On the upper deck, the *Conception*'s wheelhouse sat atop the forward end of the salon. In addition to controls for the engines and rudders, the wheelhouse contained radar and depth sounder displays, global positioning system (GPS) receivers, a very high frequency (VHF) radio, and an electronic charting system. Two crew bunks with privacy curtains were installed at the back of the wheelhouse. A short passageway led aft from the wheelhouse to a door out to the sun deck. Two small crew staterooms were located on either side of the passageway; the portside room contained two crew bunks, and the starboard side room held a single bunk. A small shower room on the starboard side aft was also accessed from the passageway. The sun deck contained benches and large boxes for storing the vessel's lifejackets and life floats, and there were two additional life floats on top of the wheelhouse.⁶ A single staircase on the starboard side of the sun deck, aft, provided access between the main deck and the sun deck.

1.2 Accident Narrative

The *Conception* had been chartered by Worldwide Diving Adventures, Inc., a scuba diving tour, instruction, and guide company, to take a group of 33 passengers on a 3-day dive trip to locations around the Channel Islands, California, over the 2019 Labor Day weekend. The voyage was scheduled to get under way from Santa Barbara, California, at 0400 on Saturday, August 31, and return by 1700 on Monday, September 2. Truth Aquatics encouraged customers to board the vessel the night before early morning departures, and passengers for the accident voyage began arriving in the evening on August 30, embarking via the main deck. Per Truth Aquatics' website and the company's *General Information Handbook*, passengers were instructed to sign a posted manifest upon boarding, store their gear, and then proceed to their bunks below deck.⁷

On the accident voyage, all bunks had assigned occupants, except for numbers 7U, 9L, 24U, and 26L (these were the upper and lower bunks of the three-high single bunks running athwartships on the aft bulkhead). Four of the ten double bunks were occupied with two passengers; the remaining double bunks had a single occupant. A *Conception* deckhand told investigators that passengers on the accident voyage kept to the posted sleeping arrangements. According to the deckhand, luggage was stowed below some of the bunks and above them, in a designated area, and the aisles between the bunks were clear of luggage at all times. Some passengers kept personal items and effects, such as purses and backpacks, with them in their bunk spaces.

The second captain (mate) was the first of the vessel's six crewmembers to arrive at the *Conception*, embarking sometime between 2200 and 2300.⁸ The first and second galley hands were next to arrive, boarding separately between 2300 and midnight. They each told investigators that after boarding, they went to their bunks on the upper deck and went to sleep. The first deckhand stated that he and the second deckhand arrived at the vessel at 0320 the next morning, and, according to crewmembers interviewed after the accident, the captain boarded about 10 minutes

⁶ *Life floats* are buoyant primary lifesaving devices designed to support a number of persons partially immersed in the water, unlike life rafts that keep people completely out of the water.

⁷ According to crewmembers, passenger bunks were generally assigned by the charterer.

⁸ The vessel was required to have a credentialed master and mate, although there is no mate's credential for vessels of this size. "Second captain" was the term used by Truth Aquatics and the *Conception* crew in lieu of mate.

later.⁹ Once on board, the deck crew began conducting pre-underway checks of the vessel's equipment. The generator was then started and shore power removed, a visual inspection of the bilges was performed, and the main engines were started and tested. The deckhands cast off lines, and, according to the vessel's automatic identification system (AIS), the *Conception* was under way at 0404 outbound from Santa Barbara Harbor.¹⁰ The captain took the helm for the outbound voyage, while the rest of the crew went to sleep until about 0600.

During Truth Aquatics' dive trips, the destinations were at the discretion of the captain and based on weather conditions and the charterer's preferences. For this voyage, the captain of the *Conception* chose to head toward Santa Cruz Island, which provided dive sites that were protected from moderate-to-high winds in the area. The vessel transited to the south side of the island and anchored at a dive site near Albert Anchorage at 0830 that morning. Once anchored, the passengers gathered in the salon to eat breakfast and listen to a safety brief.

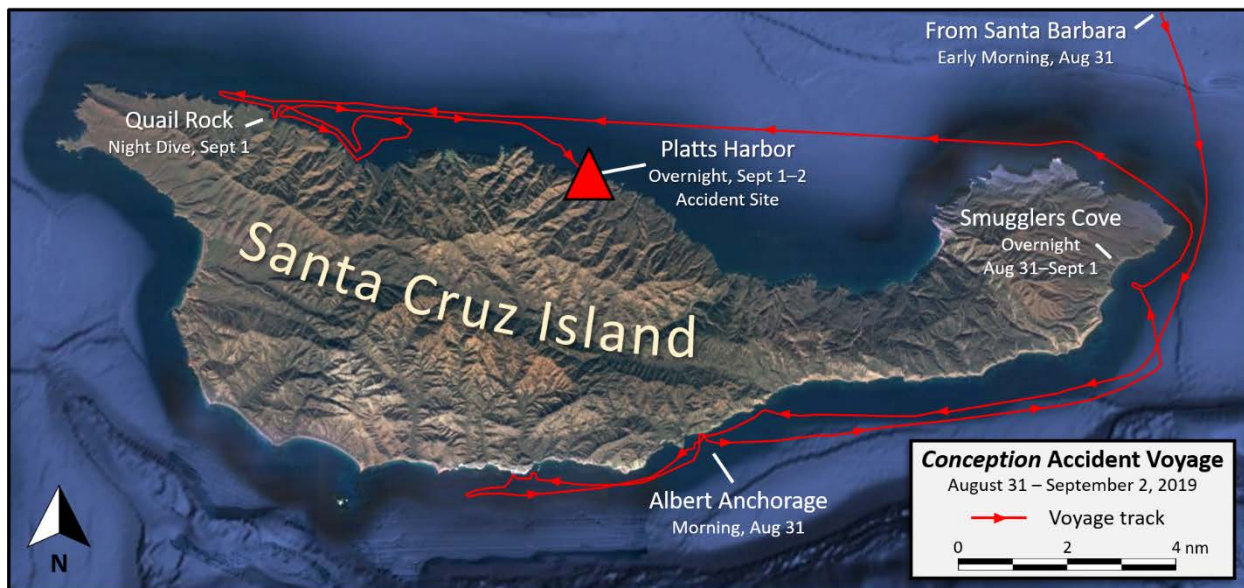


Figure 7. *Conception* accident voyage reconstructed from AIS data, with selected diving and anchoring sites at Santa Cruz Island. (Background source: Google Earth)

The standard safety brief included information on the lifejackets and other lifesaving equipment, escape routes from the passenger bunkroom and salon, the location for mustering in the event of an emergency, and dive safety information. During the accident voyage, the safety briefing, which was being conducted by the first deckhand, was interrupted when a passenger

⁹ The agency's investigation of this accident was conducted in parallel with the Office of the US Attorney's ongoing criminal investigation. The criminal investigation resulted in the NTSB having limited access to key personnel of Truth Aquatics working at the time of the accident, including the captain of the *Conception*, the first galley hand, or any employee responsible for operations. While on scene, investigators interviewed the remaining surviving *Conception* crewmembers; the owner of Truth Aquatics, former Truth Aquatics crewmembers, passengers, contractors, and service providers; and several first responders. See [Appendix A](#) for more details regarding the investigation.

¹⁰ AIS is a maritime navigation safety communications system. At 2- to 12-second intervals on a moving vessel, the AIS automatically transmits vessel information, including the vessel's name, type, position, course, speed, navigational status, and other safety-related information, to appropriately equipped shore stations, other vessels, and aircraft. The rate at which the AIS information is updated depends on vessel speed and whether the vessel is changing course. AIS also automatically receives information from similarly equipped vessels.

fainted. After the passenger was revived and his vital signs checked, the remainder of the safety brief was conducted by the captain, who, according to the deckhand, provided “an abridged version” of the dive safety section of the brief.

Over the next two days, the *Conception* transited between sites around Santa Cruz Island, anchoring at each location to allow the passengers to dive. The vessel spent the first night anchored at Smugglers Cove on the eastern side of the island. The next day, Sunday, September 1, the vessel transited to various dive sites on the north side of the island.

Between 2030 and 2130, seventeen divers conducted a night dive at a location known as Quail Rock on the northwest side of the island. While the divers were in the water, the second galley hand opened the electrical circuit breakers for the galley burners and griddle. (He told investigators that this had been the normal practice each night, ever since a burner had been left on inadvertently on a previous voyage.) He also closed the circuit breakers for the air conditioning unit to allow the bunkroom to cool before the passengers went to sleep.

Once the divers were back on board, the flashlights and cameras that they used during the dive were stowed on the two aft tables in the salon. During interviews, crewmembers stated that some of these electronics, along with cell phones and tablets, were plugged in to recharge via 110-volt alternating current (AC) receptacle outlets located between the bench seat padding and on the aft bulkhead ([figure 8](#)). Crewmembers remembered seeing at least one passenger-owned power strip being used to recharge the electronics.

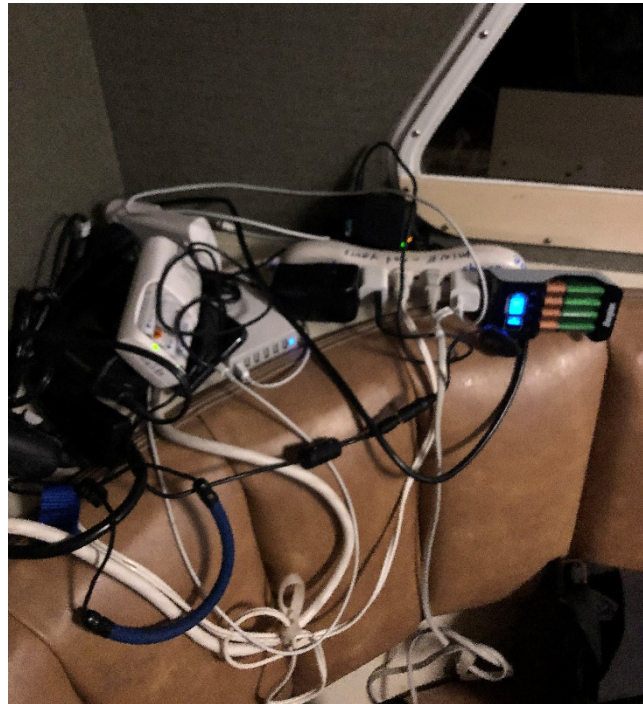


Figure 8. Photo taken during accident voyage (August 31, 2019) of devices plugged in to charge at the port side aft corner of the salon on the *Conception*. (Source: J. Dignam).

After the night dive, the *Conception* relocated to Platts Harbor, a natural, semi-protected anchorage to the east of Quail Rock, to anchor for the night. The second captain remembered seeing a large sportfishing boat (later identified as the *Grape Escape*) in the anchorage when the dive boat arrived about 2300. According to the second captain, the crew conducted a walkthrough of the main deck to check for trip hazards and to stow loose gear. The doors to the salon remained open, as they always were when passengers were on board. Sometime before midnight, each of the crewmembers went to bed: the second deckhand slept in the passenger bunkroom, and the other crewmembers slept in berths on the upper deck. Crewmembers reported that a few passengers were still awake when they left the salon to head to their berthing. There were no crewmembers assigned to monitor the position of the *Conception* while it rode at anchor (according to the second captain, there was an alarm in vessel’s wheelhouse to notify the crew if the anchor was dragging).

According to the second galley hand, he woke up about 0130 on Monday, and, as was his usual practice when he awoke in the middle of the night, he went down to the galley to collect and wash any used coffee cups and other dishes and to conduct general cleaning. He told investigators that there were no passengers or crew awake or in the salon at the time he was working in the galley. After cleaning up, he used one of the restrooms on the aft main deck and went to his bunk on the upper deck to go back to sleep. He stated that as he came out of the restroom, he looked up at a wall clock and noted that it was 0235.

Sometime later, the second galley hand was awoken by the sound of what he thought was a plastic chair sliding on the salon deck. He stated that then he heard a noise that "sounded like someone fell." He considered getting up, concerned that a person might be injured, but then heard what he thought to be the sound of the restroom door shutting. He continued to lay in his bunk, and next heard what he thought was a person yelling, "ahhh!" The second galley hand got out of his bunk to go check on the person and, looking out through the door to the sun deck, saw a yellow glow emanating from the main deck below the aft starboard side of the sun deck. Realizing what he was seeing, the second galley hand turned around and yelled "fire! fire!" to wake up the four other crewmembers sleeping on the upper deck.

The first galley hand told investigators that he had heard "a pop, and then a crackle downstairs." He then heard the second galley hand jump down from his bunk, and shortly thereafter yell, "fire!"

After warning the crew, the second galley hand ran to the staircase at the aft end of the sun deck to attempt to get down to the main deck. He stated that when he reached the staircase and looked down, the restroom at the bottom of the staircase was on fire, and flames blocked the way down. He returned to the upper deck stateroom area, told the other crewmembers that the way was blocked, and then proceeded to the port side of the sun deck. There, he climbed over the railing and lowered himself down onto the main deck.

The second galley hand stated that he ran back to the open deck, intending to enter the salon through the open rear doors to retrieve fire extinguishers. However, he could not get into the salon because the entire entryway was on fire. He told investigators that the area where the bunkroom escape hatch was located was engulfed in flames and was not visible, and the fiberglass on the ceiling of the entryway to the salon was melting and dripping down. He said that he ran aft toward the stern, but, realizing there was nothing that he could do there, he turned around again.

The second captain and first deckhand slept in the bunks in the wheelhouse, and when awakened by the second galley hand, they had both proceeded aft toward the door to the sun deck and saw the flames on the aft starboard side. They were met at the door by the second galley hand, who told them that the staircase to the main deck was blocked. Returning to the wheelhouse, the second captain and the first deckhand were instructed by the captain to lower themselves to the main deck via the wheelhouse wing stations. In a statement to investigators, the captain wrote that he opened the wing station doors on either side of the wheelhouse.

The second captain exited through the wing station door on the port side and lowered himself down to the main deck. From there, he looked to go aft, but he said that the exterior passageway was blocked by smoke and flames emanating from the salon windows. He stated that he proceeded forward and opened the bow gate on the port side, reasoning that if passengers could escape the bunkroom and get to the main deck bow, they would be able to more easily evacuate through the open gate.

From the aft deck, the second galley hand saw a crewmember lowering himself down to the main deck, so he ran forward through the smoke along the port exterior passageway. About the same time, the first galley hand was attempting to jump down to the main deck from the port wheelhouse wing station. The first galley hand told investigators that he misjudged the distance to the deck and landed with all his weight on his left leg, breaking his leg as he hit the deck. He landed in front of the second galley hand, who leapt over him and continued forward to the bow.

The first deckhand had also exited the wheelhouse via the port wing station. Once on the main deck, he looked aft and saw that the port exterior passageway was blocked by smoke and flames coming out of the salon windows and wrapping around the sun deck above. He proceeded to the bow and tried to open the center window on the forward bulkhead of the salon, which looked into the galley area, in an attempt to reach the passengers. The center window was the only window on the front of the salon that was designed to open, but it was secured from the inside by threaded knobs (it was not a designated emergency exit). The deckhand, aided by the second galley hand, struggled to pry the window open, but could not. The two crewmembers told investigators that the window was warm, but not hot, and when they looked through the window, the view was completely obscured by thick, black smoke.



Figure 9. Preaccident photo of *Conception* forward salon windows. In this photo, the center window is open. However, during the accident, the window was closed and secured as the crew attempted to access the space. The port and starboard windows were not designed to be opened. (Source: T. Thompson)

During this time, the captain was in the wheelhouse making a distress call over VHF radio. At 0314, he transmitted, “Mayday, Mayday, Mayday. *Conception*, Platts Harbor, north side Santa Cruz.” When Coast Guard Sector Los Angeles/Long Beach watchstanders responded to the distress call, the captain transmitted, “39 P-O-B. I can’t breathe. 39 P-O-B. Platts.” The smoke filling the wheelhouse then forced the captain out of the space, and he jumped into the water from the starboard side wheelhouse wing station.

As the first deckhand continued to try to open the forward salon window, he remembered a fire axe mounted in the wheelhouse. He looked up to the wheelhouse and was about to yell to the captain to get the axe when he and the second captain saw the captain leap into the water. As the captain jumped, smoke followed him down to the water. Both the first deckhand and the second captain believed the captain was on fire as he jumped. Consequently, the second captain dove into the water on the starboard side to attend to the captain.

Attempting to find another way to reach passengers, the first deckhand opened the anchor locker hatch on the bow. Looking inside, he saw that there was no access aft to the shower room and bunkroom below, and there was no smoke in the space at the time. He then checked the port and starboard exterior passageways, and both were blocked by smoke and flames.

According to the first deckhand, the captain then told the remaining three crew on the bow to jump into the water. The first galley hand was in a great deal of pain due to his broken leg, but he eventually entered the water through the port bow gate. The second galley hand and the first deckhand also entered the water. The first and second galley hand then swam away from the vessel, while the first deckhand swam toward the stern.

After finding that the captain was unharmed, the second captain swam to the stern and re-boarded the *Conception* via the vessel's swim platform, which was in the raised position with the inflatable skiff stowed on it. He proceeded up onto the open main deck and toward the salon, where he found that the entire deckhouse was being consumed by fire. He said that he "could see the aft escape was fully engulfed in flames." He stated that he opened the engine room hatch but was blocked from entering by black smoke, though he did not see flames.

The second captain's next thought was to launch the skiff so that the crew could pick up any survivors that had made it off the *Conception*. He stated that as he proceeded aft, he noted that the lights were still on in the lazarette (the hatch was normally left open), so he knew that the vessel still had electrical power. He energized the hydraulic pump for the winch that raised and lowered the swim platform and prepared to lower the skiff into the water. By this time, the first deckhand had also climbed up on the stern of the *Conception*, and he assisted the second captain in launching the skiff.

Once the boat was in the water, the second captain assisted the captain, who had swum to the stern of the *Conception*, into the boat. Meanwhile, the first deckhand went up onto the back deck of the dive boat to once again look for a way to help any passengers. The fire had continued to consume the vessel, and he found no way to get into the salon or to the bunkroom below. The fire also prevented the deckhand from accessing the fire hose and the fire pump remote start control, which were located on the port side of the vessel. He next attempted to reach the fire pump in the engine room but was prevented from entering the space due to smoke at the hatchway. (He also reported seeing no flames in the engine room.) The captain yelled at him to get in the skiff, so he went aft and boarded the small boat.

After the three crewmembers got the engine on the skiff running, they drove to where the two galley hands had swum away from the *Conception* and helped both into the boat. The first deckhand then took the controls and drove the skiff over to the anchored sportfishing boat *Grape Escape*. When they arrived at the vessel, the crewmembers yelled and banged on the hull and back door to the salon until the *Grape Escape*'s owners were awakened. The *Grape Escape* owners described their first sight of the *Conception* as "completely on fire from one end to the other. It was already completely engulfed. There wasn't a spot on that boat

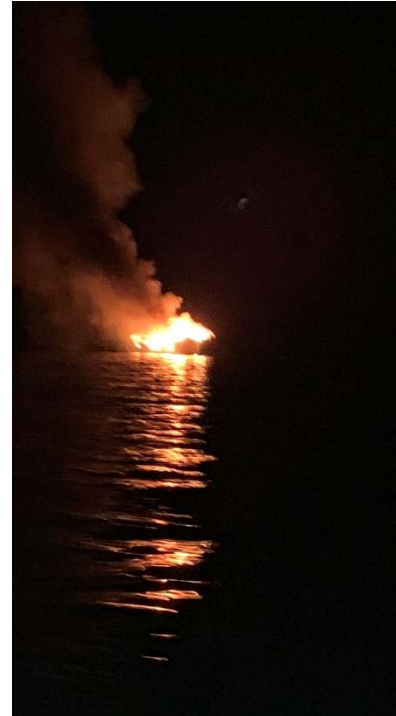


Figure 10. Cell phone photo of *Conception* on fire, taken from sportfishing boat *Grape Escape*. (Source: S. Hansen)

that wasn't on fire.” One of the owners then took the captain and second captain up to the wheelhouse to make radio calls to the Coast Guard shortly before 0329, while the other owner assisted the remaining crewmembers. The first deckhand and second galley hand assisted the injured first galley hand onto the *Grape Escape*.

1.3 Search and Rescue

The Coast Guard Sector Los Angeles/Long Beach Command Center (SCC), located in San Pedro, California, maintained command, control, and communications for Coast Guard operations in the area. The SCC received the *Conception*'s initial distress call by VHF radio at 0314:23. The SCC made repeated call-outs, which went unanswered after the crew abandoned the vessel. Using the VHF radio direction finder, the SCC was able to estimate the vessel's position and issued an Urgent Marine Information Broadcast (UMIB) at 0322:54.¹¹

Table 1. Initial VHF distress communications between the captain of the *Conception* and Coast Guard Sector Los Angeles/Long Beach.

Time (PDT)	Originator	Message
03:14:23	<i>Conception</i>	Mayday, mayday, mayday! <i>Conception</i> . Platts Harbor, north side Santa Cruz. Help.
03:14:34	Coast Guard	Vessel under distress, this is Coast Guard Sector Los Angeles on Channel one-six. What is your position and number of persons on board? Over.
03:14:42	<i>Conception</i>	[unintelligible] three-nine P-O-B. I can't breathe. Three-nine P-O-B. Platts.
03:14:54	Coast Guard	Vessel in distress, Coast Guard Sector Los Angeles. Roger. You have 29 persons on board and you can't breathe. What is your current GPS position? Over.
03:15:20	Coast Guard	Vessel in distress, Coast Guard Sector Los Angeles on Channel one-six. What is your GPS position? Over.
03:16:06	Coast Guard	Vessel in distress, Coast Guard Sector Los Angeles on Channel one-six.

The SCC then telephoned Coast Guard Station Channel Islands Harbor at 0323 and requested that they proceed to the scene for a medical emergency, based on the *Conception* captain's transmission of "I can't breathe."¹² While the crew prepared to get under way, the Station's Officer of the Day called the Ventura County Fire Department dispatch by radio to request support (at least one paramedic and advanced life support equipment) to get under way with them. At 0324, the SCC requested Coast Guard air assets located at Naval Base Ventura County (NBVC) Point Magu conduct search and rescue. The SCC also directed the Coast Guard cutter *Narwhal*, which was 5 hours away, about 6.5 miles southeast of Long Beach and already under way, to proceed to the accident location.¹³

¹¹ An Urgent Marine Information Broadcast (UMIB) is a request for assistance from any available mariners. It is broadcasted on VHF Channel 16 and by Navigational Telex (NAVTEX).

¹² Unless otherwise noted, "Station" in this report refers to Coast Guard Station Channel Islands Harbor.

¹³ *USCGC Narwhal* (WPB87335) was an 87-foot patrol boat homeported in Corona Del Mar, California.

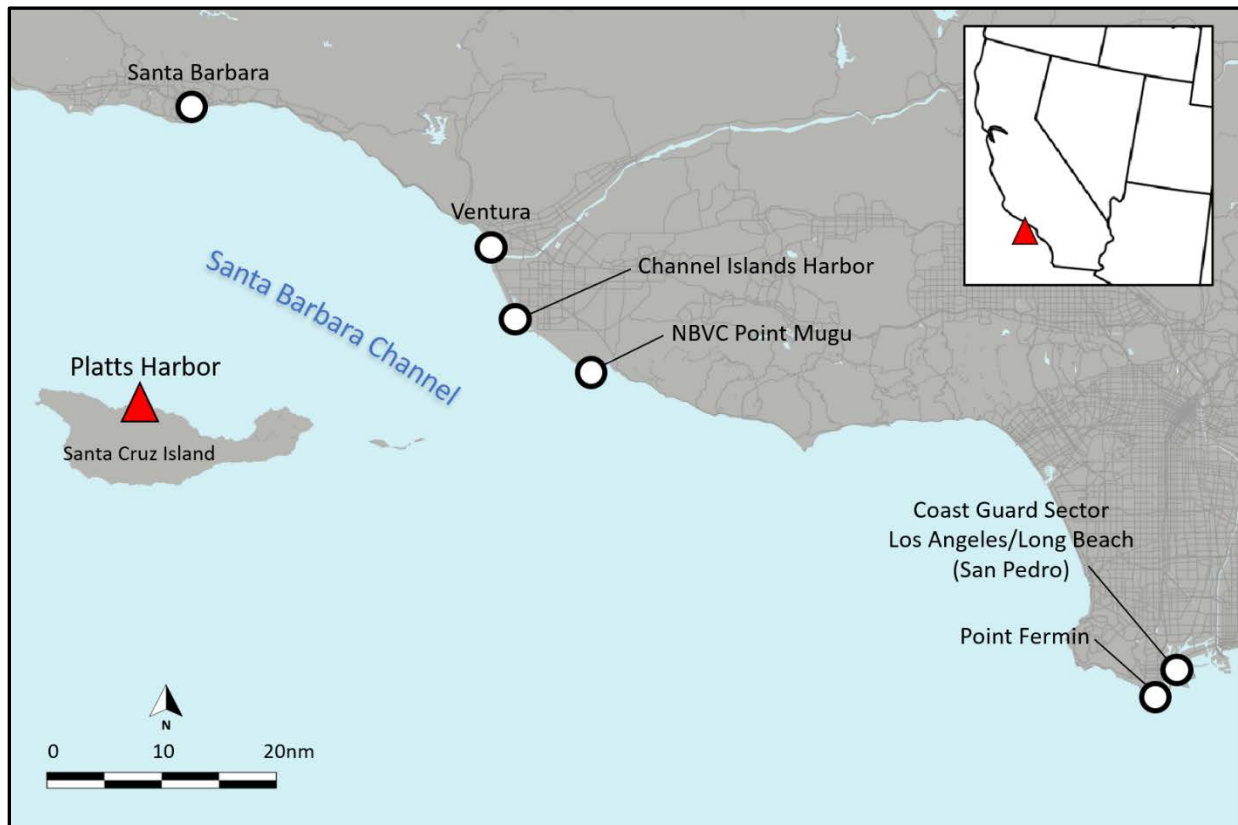


Figure 11. The accident site in relation to emergency response assets. The red triangle marks the site of the *Conception* fire. (Background: Google Maps)

At 0329, the owner of the *Grape Escape* called the Coast Guard on VHF radio, stating “We have a Mayday. I have a commercial boat on fire. Santa Cruz Island.” This was the first notification to the Coast Guard that the nature of the distress was a fire. He gave the position of the vessel, and then the second captain got on the radio and reported to the Coast Guard that there were “33 souls” trapped in the bunkroom.¹⁴ The *Conception* captain took over the radio from the second captain and explained the situation in more detail to the SCC.

The second captain and first deckhand next re-boarded the skiff to go search for survivors, while the two galley hands and the captain remained on the *Grape Escape*. The second captain stated that while the skiff circled the burning *Conception*, he and the first deckhand heard several “explosions.” The crew did not locate any survivors, and they returned to the *Grape Escape*. Later, at the SCC’s request, they made additional searches, also without success.

¹⁴ The SCC watchstander misheard the *Conception* captain say the passengers were “locked” below deck when they were actually “blocked” by fire. The second captain mistakenly omitted the missing crewmember in his initial report by radio, stating there were “33 souls” still aboard.

Table 2. VHF communications between Coast Guard Sector Los Angeles/Long Beach and the *Grape Escape*.

Time (PDT)	Originator	Message
03:29:30	<i>Grape Escape</i>	Pan-Pan, Pan-Pan, Coast Guard, Coast Guard.
03:29:35	Coast Guard	Vessel Conception, Coast Guard Sector Los Angeles on Channel one-six. Over.
03:29:39	<i>Grape Escape</i>	This is a -- actually it's a mayday. I have a commercial boat on fire. It's on Santa Cruz Island at ah --
03:29:57	Coast Guard	Vessel hailing Coast Guard Sector Los Angeles, come back or say again your last. Couldn't understand it. Over.
03:30:05	<i>Grape Escape</i>	We're at Platts Harbor on Santa Cruz Island.
03:30:12	Coast Guard	Say again the harbor name. Over.
03:30:17	<i>Grape Escape</i>	Platts Harbor. Platts Harbor.
03:30:20	Coast Guard	Roger, Captain. What is the, what is the emergency? Over.
03:30:30	Coast Guard	Vessel Conception, Coast Guard Los Angeles. What is the emergency? Over.
03:30:35	<i>Grape Escape</i>	Hang on just a second.
03:30:40	<i>Conception second captain on Grape Escape</i>	Hello. This is crew of Conception. Our boat is on fire. We are on a neighboring vessel. We have 33 souls on board down below trapped in the bunkroom. We cannot evacuate them off the vessel.
03:30:57	Coast Guard	Vessel reporting a vessel on fire. Roger, Captain. Your vessel is on fire; is that correct?
03:31:07	<i>Conception Second Captain</i>	The vessel's on fire, the vessel's name is Conception.
03:31:10	Coast Guard	Roger. Are you on board the Conception?
03:31:13	<i>Conception Second Captain</i>	We're on board a neighboring vessel. We abandoned ship.
03:31:19	Coast Guard	Roger. And there's 33 people on board the vessel that's on fire; they can't get off?
03:31:24	<i>Conception Second Captain</i>	That is correct.
03:31:27	Coast Guard	Roger. Are they locked inside the boat?
03:31:32	<i>Conception Second Captain</i>	That's correct, sir.
03:31:37	Coast Guard	Roger. Can you get back on board and unlock the boat or unlock the doors so they can get off?
03:31:43	<i>Conception Second Captain</i>	Every escape path was on fire.
03:31:48	Coast Guard	Roger. You don't have any firefighting gear at all? No fire extinguishers or anything?

Time (PDT)	Originator	Message
03:32:05	<i>Conception</i> Captain	[The captain relieved the second captain on the radio.] Coast Guard Sector LA, we could not get to the bunkroom. The fire absorbed the wheelhouse and --
03:32:26	Coast Guard	Roger, that. Is this the captain of the <i>Conception</i> ?
03:32:30	<i>Conception</i> Captain	Yes. My name is [redacted]. I got one mayday out. Smoke, in the wheelhouse there was flames at the back door and the side door. We had to jump from the wheelhouse off the boat.
03:32:59	Coast Guard	Roger. Was that all the crew that jumped off?
03:33:04	<i>Conception</i> Captain	Five of the crew from the wheelhouse jumped out. One crew is down in the bunkroom. Thirty-four people still on board, okay?
03:33:22	Coast Guard	Roger. Is the vessel fully engulfed right now?
03:33:26	<i>Conception</i> Captain	To the deck. Fully engulfed to the deck.

At 0335, the SCC broadcast another UMIB with the name and position of the vessel and indicating that the vessel was on fire. The crew at Coast Guard Station Channel Islands Harbor overheard the radio conversation between the *Conception* crew on board the *Grape Escape* and the SCC, and between 0342 and 0349, they launched two 45-foot response boats-medium (RB-Ms). At 0343, the Ventura County Fire Department (VCFD) Engine 53 company captain requested an additional engine company respond aboard Channel Islands Harbor Patrol *Boat 15*, a 32-foot fire boat jointly operated with the VCFD.

Channel Islands Harbor Patrol overheard the Coast Guard radio traffic on both VHF and VCFD frequencies, retrieved the *Conception*'s AIS position from an online source, and immediately prepared its *Boat 15* to respond once an engine company arrived. *Boat 15* was under way with the crew of Engine 54 at 0404 (Ventura City Harbor Patrol's fireboat, *Boat 1*, later got under way, with Engine 26, at 0448).

Multiple additional agencies responded to the Coast Guard Channel Islands Station, where an Incident Command Post was set up at 0358.¹⁵

The first Coast Guard RB-M arrived on scene at 0427 after travelling 27 miles and crossing the channel through conditions of reduced visibility; they found the *Conception* completely engulfed in flames and began searching for survivors. The second Coast Guard RB-M, with VCFD Engine 53 embarked, arrived on scene immediately after and assumed the role of on-scene coordinator (OSC).¹⁶ Two firefighters (a paramedic and an emergency medical technician [EMT]) from the second RB-M boarded the *Grape Escape* to assess the injured *Conception* crewmembers, and then the boat began searching the area for any other survivors.

¹⁵ Agencies responding to Coast Guard Channel Islands Station included the VCFD, Channel Islands Harbor Patrol, Ventura County Sheriff's Department, VCFD Public Affairs, Ventura County Coroner's Office, Channel Islands Parks Service, and the owner of the *Conception*.

¹⁶ The *on-scene coordinator* is the designated vessel or aircraft assigned to coordinate the activities of all participating search units.

Each RB-M was equipped with a P6 portable dewatering pump, which was the only equipment that could be used for firefighting.¹⁷ Since *Boat 15* was en route with more pump capacity and the firefighting foam required to fight a fire of this size, the two RB-Ms searched for survivors in the water, deeming it a higher priority after concluding that there were likely no survivors in the wreck given the mass conflagration.

A Coast Guard helicopter arrived on scene about the same time as the Coast Guard RB-Ms. When the paramedic and EMT from the RB-M had boarded the *Grape Escape*, they determined that the first galley hand needed to be evacuated. However, due to the risk of entanglement with the rescue litter and the *Grape Escape*'s rigging, the Engine 53 crew determined that it was safer to leave the injured crewmembers on the *Grape Escape* rather than transfer them to the helicopter.

The two RB-Ms, the *Conception* skiff, other small boats, and Coast Guard helicopters continued to search the area and the shoreline for survivors and found none.

Channel Islands Harbor Patrol *Boat 15* arrived on scene at 0455, followed by Santa Barbara Harbor Patrol's *Boat 3*, and commenced fire suppression efforts. Shortly after, at 0502, the *Retriever II*, a 30-foot, rigid-hull, inflatable boat owned by TowBoatUS Ventura, arrived on scene and began towing the burning wreck away from the shallow water with a grappling hook to a location where the fire boats could better reach it.

The fire was first reported extinguished at 0508 but re-flashed several times in the area of the fuel tanks and on the bow. Burned-out through-hull penetrations—where the main engine exhausts had been—eventually submerged, and the vessel sank stern first at 0654, approximately 20 yards from shore, in 61 feet of water. First responders were not able to safely board the vessel before it sank. Underwater recovery divers later found the wreckage lying on the seafloor in an upside-down position.



Figure 12. Small passenger vessel *Conception* at sunrise prior to sinking. (Source: VCFD)

The *Grape Escape* departed the accident site at 0516 to transport the surviving *Conception* crew to Coast Guard Station Channel Islands Harbor, arriving about 0735. The *Conception* captain

¹⁷ The CG-P6 gasoline motor-driven dewatering pump is used primarily for emergency dewatering of vessels. It has a rated output of 250 gallons per minute at a 12-foot suction lift. Under load, this pump will dewater for approximately 4–5 hours on the gasoline supplied with the kit.

stayed on scene aboard one of the RB-Ms until it departed the scene at 0743 and returned to the Station.

At 0804, the remains of four victims were recovered on the surface and transported to Santa Barbara Harbor, where they were transferred to the Santa Barbara County coroner's office. Air and surface search and rescue efforts continued thereafter until suspended by the Sector Commander at 0938 on September 3. No equipment damage or first responder injuries were reported.

Over nine days, divers from several local law enforcement agencies and the Federal Bureau of Investigation (FBI) dove on the wreck. They recovered all but one of the remaining victims, most of whom were found in the bunkroom or nearby on the seafloor. The last victim was recovered on the surface in shallow water along the shore, near the accident site, on September 11.

Table 3. Summary of resources assigned in the initial response.

Name/hull/tail number	Type and affiliation	Role	Arrival time at scene
CG 45643	Response Boat-Medium - Coast Guard Station Channel Islands Harbor	First search and rescue unit on scene	0427
CG 6540	HH-65 helicopter - Coast Guard Air Station San Francisco (forward deployed to NBVC Point Mugu)	Search and rescue, medical response, and first OSC	0432
CG 45739	Response Boat-Medium - Coast Guard Station Channel Islands Harbor with VCFD Engine 53 embarked	Search and rescue, OSC	0432
Boat 15	Fire boat - Channel Islands Harbor Patrol and Ventura County Fire Department. Engine 54 embarked (also called <i>Boat 5</i> by some witnesses and in AIS data)	Fire suppression	0455
Retriever II	Commercial towing vessel - TowBoatUS Ventura Harbor	Towing support and victim recovery	0502
Boat 3	Patrol boat - Santa Barbara Harbor Patrol	Fire suppression	0518
Boat 1	Patrol boat - Ventura City Harbor Patrol with VCFD Engine 26 embarked	Ferried foam to the scene	N/A - mechanical failure
Narwhal (WPB 87335)	Coast Guard Patrol Boat homeported in Corona del Mar	Assumed OSC on arrival	0841
CG 6014	MH-60 helicopter - Coast Guard Air Station San Diego	Search and rescue	0940

1.4 Injuries

Of the 39 persons on board the *Conception* at the time of the accident, 33 were passengers, and 6 were crewmembers. Passenger ages ranged from 16 to 62 years, with a median age of 41 years old. There were 13 male and 20 female passengers (two were female minors under the age of 18 years); all 33 passengers perished in the fire. The second deckhand, a 26-year-old female, also perished in the fire.

The first galley hand suffered a closed fracture of the left tibia. The second galley hand bruised his right foot when jumping from the top deck, only realizing that he was injured when he boarded the *Grape Escape*.

Table 4. Injuries sustained in the *Conception* accident.¹⁸

Type of Injury	Crew	Passengers	Total
<i>Fatal</i>	1	33	34
<i>Serious</i>	1	0	1
<i>Minor</i>	1	0	1
<i>None</i>	3	0	3

The Santa Barbara Sheriff's Office, Coroner's Bureau conducted an examination of the victims recovered, and a coroner's report was completed for each of the 34 victims. The Sheriff-Coroner conducted external examinations on each of the decedents but elected not to conduct internal examinations. The Santa Barbara Coroner's Bureau stated more complete autopsies were not performed because the cause of death was easily determined by a body examination and toxicology tests and there were witnesses to the event.

According to the coroner's reports, the cause of death in every case was smoke inhalation. Additionally, in two cases, carbon monoxide was found to be contributory.¹⁹ Carbon monoxide is a product of incomplete combustion and is a central nervous system depressant. Carbon monoxide also binds readily with hemoglobin and displaces oxygen in the blood.

External examinations conducted by the Sheriff-Coroner, as confirmed by recovery divers' video, documented 27 decedents as being fully or partially clothed. One female passenger was wearing a jacket, while another had plastic reading glasses entangled in her hair. The coroner reports also documented that 14 people were wearing some sort of footwear, including the second deckhand, who had sandals on both of her feet. Three other cadaver bags included footwear, though not worn at the time of arrival ashore, and one contained a backpack. One passenger had a hiking boot on one foot and a sandal the other, and a phone in his hand. None of the victims were found with any type of smart or dive computer watch, which could have provided a timeline of the victims' activity as well as information regarding the victims' vital signs.

At least four phones were recovered with the victims and at least five in the wreckage, all with no visible signs of heat damage. These were taken into possession by the FBI for examination to recover any relevant information, such as pictures and video of the vessel or any attempt to place phone calls or send messages at the time of the fire. At the time of publication of this report,

¹⁸ The NTSB uses the International Civil Aviation Organization injury criteria in all of its accident reports, regardless of transportation mode. A serious injury is a non-fatal injury that requires hospitalization for more than 48 hours, commencing within 7 days from the date the injury was received; results in a fracture of any bone; causes severe hemorrhages, nerve, muscle, or tendon damage; involves any internal organ; or involves second- or third-degree burns, or any burn affecting more than 5 percent of the body surface.

¹⁹ Toxicology testing on the *Conception* victims indicated carbon monoxide saturation levels between 39 and 75 percent, with a median 62 percent. The highest levels were reported as greater than 75 percent. According to National Fire Protection Association guidance, carbon monoxide levels of 40 percent or higher indicate that victims "likely to have died from CO [carbon monoxide] alone or in combination with other factors...or may simply have been incapacitated sufficiently by CO poisoning to be unable to flee the fire." National Fire Protection Association, *NFPA 921 Guide for Fire and Explosion Investigation*, 2017, Quincy, Massachusetts, 2016, page 263.

one phone had been examined and the obtained information reviewed by the NTSB (see [Appendix A](#) for more details of the investigation).

Cell phone records for the captain, first galley hand, and second deckhand were analyzed by the NTSB, and none of the cell phone records indicated any user-initiated activity during the time of or after the accident.

1.5 Vessel Information

1.5.1 Applicable Regulations

Title 46 *Code of Federal Regulations (CFR)* Subchapter T governs the construction, outfitting, and operation of small passenger vessels, like the *Conception*, that are under 100 gross tons and carry 150 or fewer passengers or have overnight accommodations for 49 or fewer passengers. The current regulations under this subchapter were significantly updated in 1996, and vessels constructed after 1996 are required to comply with all of the current regulations. Vessels constructed before 1996 (known as “existing vessels”) are required to comply with portions of the current regulations, including those pertaining to inspections and certification, vessel control and other systems and equipment, and operations. For regulations relating to construction and arrangement, lifesaving equipment, some fire protection equipment, machinery installation, and electrical installation, vessels that existed prior to 1996 are subject to those portions of Subchapter T regulations that were in force at the time the vessel was built, with certain exceptions. When referring to the post-1996 regulations, Coast Guard inspectors use the term “New Subchapter T” or, more simply, “New T” regulations, and when referring to the pre-1996 regulations, they use the term “Old Subchapter T” or “Old T.” As a vessel built in 1981, the *Conception* was considered an existing vessel and therefore subject to portions of both the pre- and post-1996 regulations. In this report, “New T regulations (all vessels)” and “Old T regulations (existing vessels)” will be used to differentiate between the two sets of regulations as they applied to the accident vessel.

1.5.2 Main Engines and Propulsion

The *Conception* was propelled by two 550-hp, 2-stroke, Detroit Diesel engines. The turbo-charged, 92 series, V-8 engines drew combustion air from the engine room, which was ventilated from ducting leading out to the main deck. The engines were bolted to Twin Disc MG-514C Series marine transmissions that acted as both reduction and reversing gears. The transmissions coupled directly to 3-inch stainless steel shafts. The shafts exited the hull of the vessel through bronze compression packing glands and connected to two four-bladed propellers. The propellers, along with two stainless steel spaded rudders, provided maneuvering. An electric motor-driven hydraulic pump in the vessel’s engine room powered control valves and actuators attached to the rudder posts.

At the time of the fire, the *Conception* was at anchor, and neither main engine was operating.

1.5.3 Electrical Generation and Distribution

Generator. The *Conception* had a single Northern Lights MP55C generator package located in the aft port corner of the engine room. While the vessel was away from the dock, the generator package supplied the vessel with 120/208-volt, alternating current (AC), 3-phase electrical power. The generator package consisted of an 83-hp John Deere diesel engine prime

mover, coupled to a Newage 55-kilowatt generator. At the time of the accident, the generator package was running and providing the vessel with electricity.

The generator's engine had been replaced with a new model in September 2018 due to wear. In the months prior to the accident, the new engine would reportedly overheat if put under high electrical demand. If the flat-top stove in the galley was being used at the same time that scuba tanks were being filled with nitrox, the generator's engine would overheat and eventually shut down. As a result, a standard procedure was established for the deck crew to coordinate with the galley crew so that galley equipment was not operated while scuba tanks were being filled with nitrox.



Figure 13. The salvaged hull of the *Conception*, looking from aft to forward, with recovered engine room and lazarette equipment placed in their original installed location (with the exception of the water heater, which was located on the starboard side).

Electrical Distribution. The vessel's grounded, 3-phase AC electrical distribution system consisted of a neutral lead and three conductors. While the vessel was docked, a shoreside power connection could be used in lieu of the generator to provide the vessel with single-phase power. Thermal circuit breakers provided overcurrent protection. Original vessel electrical schematics indicated that the rating for these breakers varied with application. For the larger 3-phase, 208-volt equipment, each phase was protected with either a 30- or 60-amp breaker. The smaller 120-volt, single-phase equipment and lighting was protected by 15- and 20-amp breakers.

Original wiring schematics showed that the *Conception* had both 12-volt and 24-volt direct current (DC) voltage systems. The wheelhouse had a 12-volt battery system that was set up to be trickle-charged from the vessel's service 120-volt AC system. The battery and charger were located

under the console in the wheelhouse. The plans indicated that the 12-volt system was set up to power navigation lights, radio equipment, and selected lighting in the engine room, lazarette, bunkroom, anchor room, and restrooms. The propulsion engines' starters and shifting actuators operated on 24 volts, while the propulsion engines' controls and the vessel's diesel generator starter and control systems operated on 12 volts. The batteries used for both main engines and generator set were located on the forward workbench in the engine room. Battery chargers were set up for respective voltages and located on the forward bulkhead. Aboard the *Conception*, normal charging of the main engine batteries was accomplished via the ship's service 120-volt system. The main engines' attached alternators had their drive belts manually removed and were only used in a stand-by capacity. In contrast, the generator set's alternator was used and charged its batteries while the generator was running.

In August of 2000, Coast Guard inspectors issued a deficiency for the vessel having non-approved wiring in some of its AC electrical system. The *Conception* was required by Old T (existing vessel) regulations to use stranded or braided conductor core wire. Instead, the wiring being used was flexible "service" wire, commonly referred to in industry as SO, SJO, or STO wiring. It was similar in type to that used in commercially sold extension cords. Both Old T and New T regulations prohibited the use of this wire in the way it was being used aboard the *Conception*. This wiring had been installed by the boat builder and approved by Coast Guard inspectors in 1981 during the original construction of the vessel. Truth Aquatics appealed the Coast Guard's decision and requested a waiver to the Coast Guard's requirements but was denied. In 2002, all non-approved wiring was replaced with approved wiring, and, following a Coast Guard inspection, the vessel was deemed to be in compliance and the deficiency cleared.



Figure 14. Bunkroom emergency lighting on board the similar vessel *Vision*. The lighting was of the same make and in a similar location as was on board the *Conception*. Also note the public address system speaker to the right of the lights.

Emergency Lighting. The *Conception* had emergency lighting in the bunkroom. It was mounted near the main stairs going up to the galley/salon at the top of the forward bulkhead of the bunkroom, and was designed to automatically activate, in the event of the loss of the vessel's service supply power, to provide lighting along the escape path to the main deck from accommodation spaces below. The emergency lighting was powered from the ship's service 120-volt AC system, and if this source was lost, batteries internal to the unit would supply power for lighting.

Replacement of Electrical Components. Throughout the 39-year operation of the *Conception*, many electrical components had been changed with "replacement in kind" alternatives, such as circuit breakers and receptacle

outlets.²⁰ Subpart G of New T regulations (all vessels) specifies that if a repair or alteration is not a replacement in kind, the owner or managing operator must submit to the local Coast Guard unit drawings, sketches, or written specifications describing the details of the proposed alteration. The Coast Guard would then initiate a plan review to determine if the repair or alteration was safe and within regulations. Most reviews are handled locally at the Coast Guard sector or detachment level. If the repair or alteration is deemed “major” by the Officer in Charge, Marine Inspection (OCMI) at the sector, then the plan review is elevated to the Coast Guard’s Marine Safety Center in Washington, D.C. At the Marine Safety Center, professional engineers, naval architects, and/or subject matter experts conduct the plan review and issue recommendations, interpretations, or guidance to the respective OCMI.

Crewmembers reported to investigators that in the weeks prior to the accident, two of the vessel’s deckhands changed out the overhead florescent lighting fixtures in the salon with new LED light fixtures. Plans detailing the modification were not submitted to the local Coast Guard Marine Safety Detachment (MSD), and the Coast Guard was not notified of this change. Truth Aquatics last submitted plans for review in 2000 for the installation of a galley hood heat detection sensor, which was required by New T regulations (all vessels). The plans were approved by the OCMI at Coast Guard Sector Los Angeles/Long Beach.

1.5.4 Air Conditioning System and Ventilation

The heating, ventilation, and air conditioning system on board the *Conception* consisted of a combination of supply and exhaust fans, natural ventilation, and an air conditioner in the bunkroom. According to a former crewmember, the only heater on board was a small plug-in space heater located in the wheelhouse. The crewmember stated that this heater was used occasionally during the winter months but usually was not used during the summer season.

The engine room used both natural ventilation and two forced-draft fans to supply air for cooling and engine combustion consumption. Outside supply air was ducted into the engine room from openings on the aft main deck. In the event of an engine room fire, these ducts could be closed manually by dampers, with the shutoffs located on the main deck port- and starboard-side across from

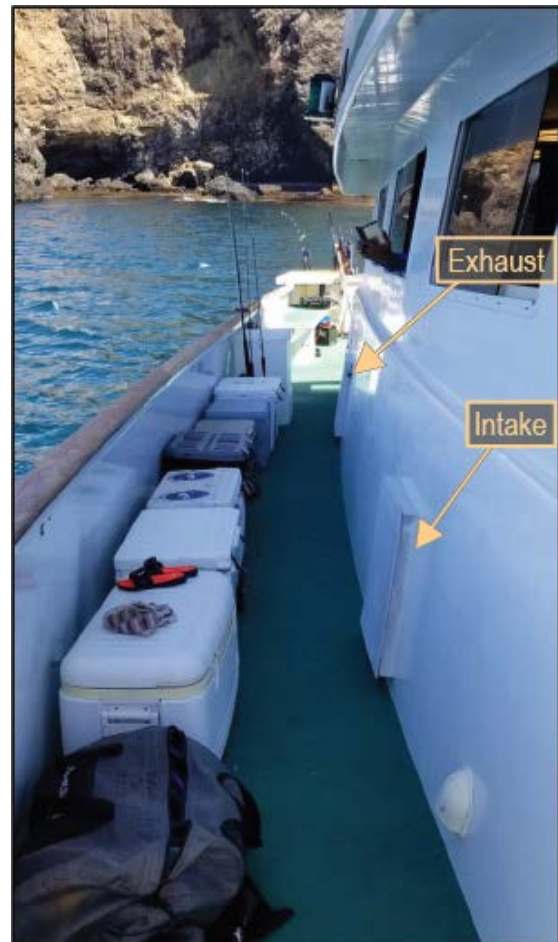


Figure 15. The starboard-side main deck of *Conception*, looking aft from forward of the galley. Arrows indicate the location of the bunkroom ventilation intake and exhaust ducts. Note the sliding windows. (Source: R. White)

²⁰ According to 46 CFR 136, *replacement in kind* refers to the “replacement of equipment or components that have the same technical specifications as the original item and provide the same service. If the replacement item upgrades the system in any way, the change is not replacement in kind.”

the engine room hatch. On the night of the fire, the ducting in the engine room was not closed by the crew.

Another ventilation fan was positioned in the bulkhead that connected the engine room to the lazarette. The fan could be run to supply additional air to the engine room (pulled through the lazarette), or in reverse to supply warm engine room air exhausting to the lazarette, where scuba diving suits were hung to dry. Investigators were unable to determine in which direction the fan was operated on the night of the accident. According to the owner, it was normal procedure when at anchor at night to have the fan in reverse operation.

The galley flat-top and twin burner stove had a mechanical extraction fan directly above the stove, which was used while cooking to expel fumes via a duct directly outside to the port forward main deck.

The salon used natural ventilation via the three sliding windows on each side of the salon and the outward-opening window at the forward galley area. Crewmembers stated that, at the time of the accident, the aft port and starboard sliding windows in the salon were open several inches for ventilation and the forward, outward-opening galley window was closed. The aft salon doors were also open for ventilation, as they always were while the boat was at sea with passengers on board. These doors were only closed when the boat was docked, not being used, and with no one on board.

The wheelhouse and crew staterooms on the upper deck of the *Conception* also relied on natural ventilation through windows, the wheelhouse wing doors, and the door to the sun deck. At the time of the accident, it was reported by the crew that the sun deck door was open, the port and starboard wheelhouse wing doors were shut, and the positions of the stateroom windows were unknown.

The bunkroom regularly used a combination of circulation fans and an air conditioning unit. The supply fan, located at the forward end of the space, drew air through ducting that originated 12 inches above the main deck. The ducting attached to air plenum boxes that were about 6–10 inches off the main deck. These boxes were located on both the port and starboard sides, just below the forwardmost side salon windows. Two exhaust fans, one located on each side of the aft area of the bunkroom, expelled air from the space to the main deck. The ducting for these fans led to identical plenum boxes, which were located aft of the intake plenum boxes.



Figure 16. Port side of the *Conception's* bunkroom looking aft, with inset of grille/diffuser. (Source: M. Ryan; Inset: S. Landis)

The air conditioning unit, which was the primary means of cooling and ventilation for the bunkroom, was located under the bunkroom deck boards, just port of midship, underneath bunks 30U, 31M, and 32L (see [figure 5](#) for the bunkroom layout) in the vessel's bilge area. The unit was sized for the space and was estimated to be 4–5 tons. The direct expansion package unit consisted of an evaporator coil, blower fan, compressor, and seawater-cooled condenser. The system was designed to pull air from the space through a diffuser and filter element, located at the forward end of the space, directly at the bottom of the stairs. The blower fan would draw ambient air across the evaporator coil and discharge the cool conditioned air through a network of flexible insulated distribution ductwork located in the bilge. This ductwork connected to permanent ducts and passageways built into the framework of the bunkroom. Each bunk was fitted with a grille/diffuser that could be opened or closed dependent on need. Similar grille/diffusers and ductwork were positioned on the overhead between the rows of bunks on both the port and starboard sides.

A month prior to the accident, a technician had been called to the vessel to repair a leak on the condenser tubing, which required some soldering to fix. Since the repair, the unit had been operating as expected.

It was standard practice for the vessel's crew to only operate the air conditioner through the night when the passengers were sleeping. A crewmember would turn the unit on and off by means of a circuit breaker located in the circuit breaker panel at the top of the stairs leading down to the shower room. At the time of the accident, the air conditioning system was in operation; a crewmember stated that he closed the breaker to the air conditioner before going to bed.

The air conditioning unit was recovered still in place in the wreckage and was examined by investigators. There were no signs of mechanical failure to the components of the unit. The air conditioning system was not connected to the vessel's emergency power. None of the surviving crewmembers turned off the air conditioning system at the time the fire was discovered. The unit would have operated until the *Conception's* main power was lost (although there was no means to confirm that this occurred).

1.5.5 Auxiliary Systems

Bilge and Fire Main Systems. The bilge and fire main systems were interconnected on board the *Conception*. The fire pump or bilge pump could be used to pump out the vessel's bilges. According to the crew, during normal operations, when bilges were not being actively pumped, the fire main was lined up in a ready state, with the bilge crossover valves shut. Located on the port side forward in the engine room, the fire pump was driven by a 208-volt electric motor.

The 1.5-inch diameter Jabsco bilge pump was driven off the starboard main engine. Bilge level sensors were positioned below the deck in the engine room, bunkroom, lazarette, shower room, and forward of the collision bulkhead. If a high-liquid level in a space was reached, the sensor would be activated, and an alarm would sound in the wheelhouse to notify the operator. A series of 1.5-inch piping connected the bilge spaces to the pumps, which were normally lined up to pump overboard.

Diesel Fuel Tanks. The *Conception* had two steel 800-gallon diesel fuel tanks that stored fuel for the vessel's two main engines and electric generator. At the time of the fire, the vessel was carrying about 1,400 gallons of fuel. The tanks were constructed of steel and located alongside the hull on the port and starboard sides of the forward engine room. Held in place by wooden frames, their outboard side was shaped to match to the side of the vessel. Filling and venting of the tanks were accomplished via steel pipes running up to the aft main deck. To secure fuel from the tanks

to the engines in an emergency, two handwheels (located in the port and starboard main deck restrooms) were connected to the main supply valves through linkages. Operating fuel supply to the main engines and generator was through their respective engine-driven fuel pump and a network of both copper piping and fuel-rated synthetic hose.

Water and Sewage. Fresh water on board the *Conception* was stored in four polyethylene tanks located on the forward bulkhead of the lazarette. The total freshwater storage capacity in these four tanks was 1,200 gallons.

The vessel's three pressure saltwater toilets drained to a plywood and fiberglass sewage holding tank in the engine room. The tank, which was situated midships along the forward bulkhead, was covered with a workbench. The bench functioned not only as a workspace but also as a platform for the 12- and 24-volt marine engine-starting batteries. Once full, the sewage tank could be drained overboard after the vessel was under way and at least 3 miles away from shore.

Additionally, the vessel had several auxiliary freshwater and saltwater pumps, located in the engine room and lazarette. These pumps were used for washing down the deck, cleaning scuba diving equipment, and other onboard tasks.

Air Compressors. To fill scuba air bottles, the *Conception* used three breathing air compressors, which operated off 3-phase, 208-volt alternating current. All three compressors were used solely for filling air bottles. They were operated manually by the crew and could be used independently or in conjunction with each other depending on demand and purpose. The two primary Ingersoll-Rand air compressors were in the aft starboard corner of the engine room. The third compressor was part of a nitrox generator unit, positioned in the forward starboard corner of the lazarette. According to crewmembers interviewed, none of the air compressors were in use at the time of the accident.

Winches. The *Conception* had two winches on board. The bow capstan winch was powered by a 208-volt, 5-hp, 3-phase electric motor. It was used to haul the vessel's bow anchors and heave mooring lines as needed. The stern electric hydraulic winch system was powered by a similar 1-hp motor and was primarily used to hoist and lower the vessel's swim platform, which acted as a cradle for the vessel's rigid hull inflatable skiff. Neither of these winches were wired to the vessel's emergency power, nor were they in use prior to the fire.

1.5.6 Galley Equipment

The galley consisted of a two-burner cooktop, flat-top griddle, double oven, microwave, coffee pot, and refrigerator. Midships in the salon aft of the galley was a fountain soda dispenser, ice maker, and a large refrigerated cooler. On the open main deck aft of the salon doors, there was a barbecue grill. All equipment was electric. As a precaution, at night, the flat-top griddle and two-burner cooktop were secured via the breaker panel located at the top of the stairs leading to the shower room. On the night of the accident, the second galley hand stated that he turned off this equipment by opening the respective circuit breakers. The first deckhand stated that, at the time of the accident, the refrigerators were the only galley equipment running. Above the flat-top griddle was a fixed-temperature heat detector, which had been replaced on February 23, 2016. The siren was set to alarm at 135°F and would sound locally in the galley when activated.

1.5.7 Maintenance and Repair

Most of the maintenance on board was conducted by the crew under the direction of the captain. Crewmembers told investigators that some equipment on board the vessel, such as the

main engines, generator, and air compressors, were maintained regularly under the direction of the captain. Crewmembers also said that equipment maintenance was recorded, and running logs were kept for equipment and rounds made. All records and logs were kept on board and were lost in the fire.

Conception crewmembers told investigators that they conducted maintenance and engine room rounds and documented them in a log, which showed a general maintenance checklist for much of the vessel’s engine room equipment. Similar logs were found aboard the *Vision*, a Truth Aquatics vessel similar in size and type to the *Conception*. The *Vision*’s round sheets showed routine daily engine room checks, and the vessel’s logs documented equipment maintenance history, which reflected the maintenance instructions. Maintenance completed by the *Vision*’s crew consisted of oil changes, coolant flushing, filter changes, zinc renewal, pump rebuild, and belt replacement.

Engine Room Check Log																				
CHECK GENERATOR SEA STRAINERS BEFORE EACH TRIP																				
Date	Initials	Port Main			Sibd Main			Port Genset		Sibd Genset		Port Comp	Sibd Comp	Nitrox Comp	Water %	Fuel Gal	Fire Pump	Flush Heater	Reverse Fan	Notes
		Engine	Trans	Water	Engine	Trans	Water	Oil	Water	Oil	Water									

Figure 17. Engine Room Check Log used on the Truth Aquatics vessel *Vision* (Source: Truth Aquatics).

The owner of the *Conception* stated that if the captain deemed that the maintenance was outside the capability of the vessel’s crew, the captain would schedule an outside contractor to come on board and carry out the work and/or repair.

1.5.8 Certification, Inspections, and Examinations

The *Conception* was required to have a valid Certificate of Inspection (COI) issued by the Coast Guard. As stated in the New T regulations (all vessels), the COI:

describes the vessel, the route(s) that it may travel, the minimum manning requirements, the survival and rescue craft carried, the minimum fire extinguishing equipment and lifejackets required to be carried, the maximum number of passengers and total persons that may be carried, the number of passengers the vessel may carry in overnight accommodation spaces, the name of the owner and managing operator,...and such other conditions of operations as may be determined by the cognizant [Coast Guard OCMI].

A COI is issued by the Coast Guard and is valid for 5 years for vessels traveling on domestic routes. Prior to renewal at the end of 5 years, the vessel must be inspected to ensure that it is in satisfactory condition, fit for the service intended, and complies with regulations. The inspection includes examination and testing of the vessel’s structure, machinery, and equipment, and may include fire, abandon ship, or man overboard drills. The OCMI may require the vessel to get under way for the inspection.

The *Conception* had a valid COI issued on November 19, 2014. Per the COI, the vessel was required to be manned by a credentialed master and mate, as well as two uncredentialed

deckhands.²¹ The vessel could carry up to 99 passengers but was limited to 46 passengers for overnight accommodations. The COI listed the *Conception*'s hull material as "wood."

A vessel carrying a COI valid for 5 years must also be inspected annually. The scope of the annual inspection is the same as the inspection for certification but in less detail, unless the Coast Guard inspector finds deficiencies or determines that a major change has occurred since the last inspection. If the vessel passes the annual inspection, the inspector endorses the COI. If a vessel does not pass an inspection, the attending marine inspector may place operational controls on the vessel, such as an order requiring a correction "prior to carriage of passengers," until deficiencies are rectified to the satisfaction of the marine inspector.

In addition to certifications and annual inspections, vessels that operate on domestic routes and are exposed to salt water more than 3 months per year are required to undergo a drydock hull examination and an internal structure examination every 2 years.

To aid in the conduct of these inspections, the Coast Guard issued inspectors the *T-Boat Inspection Book*, CG-840 TI, which contains checklists for each of the areas normally covered during an inspection. The CG-840-TI was not required to be used or retained by inspectors and was last updated in 2011. Coast Guard sector commands and MSDs may also have supplemental or compressed checklists for inspections. MSD Santa Barbara, a sub-unit of Sector Los Angeles/Long Beach that was responsible for conducting the regulatorily mandated inspections of the *Conception*, had a "Small Passenger Vessel – T" checklist that was last updated in 2014.

MSD Santa Barbara conducted the 5-year COI renewal inspections, annual inspections, and biannual drydock hull and internal structural examinations on the *Conception*. The detachment had two officers assigned as inspectors, and, according to the Coast Guard, the inspectors were appropriately qualified for the inspection of small passenger vessels under Subchapter T. The MSD Supervisor, the officer overall responsible for all activities at the detachment, was also a qualified inspector. According to the Supervisor, there were about 74 domestic vessels under the MSD's area of responsibility, most of which were small passenger vessels regulated under Subchapter T.

During the 2014 inspection for certification, subsequent annual inspections, and biannual hull and structural inspections aboard the *Conception*, minor discrepancies were reported, and the vessel owner corrected the discrepancies either immediately upon discovery or soon thereafter. One "prior to carriage of passengers" operational control was issued in February 2016 because the operator could not prove that the fire pump was operational. The operational control was removed the day after it was issued when the inspector witnessed the proper operation of the pump. There were no discrepancies reported in the annual inspection conducted in February 2019. The last Coast Guard drydock inspection took place in February 2019, in conjunction with the annual inspection. There were no discrepancies noted during the examination. For all inspections from 2014 onward, the inspection for certification and subsequent annual inspections were conducted by the same MSD Santa Barbara inspector. All hull and structural examinations from 2015 onward were also conducted by the same MSD Santa Barbara inspector.

²¹ For voyages of less than 12 hours, the crew requirement was reduced to a credentialed master and two uncredentialed deckhands.

In eyewitness photos and videos of the *Conception*, large polyethylene trash cans can be seen throughout the interior and exterior areas of the vessel, including the bunkroom. The trash cans were manufactured by Rubbermaid from 2016 onward. Neither the Old T nor the New T regulations allow for these types of trash cans to be used in passenger bunkrooms and instead require that trash cans be constructed of non-combustible materials. New T regulations extend the prohibition on combustible trash cans to all compartments, but only apply to existing (Old T) vessels when the trash cans are replaced. Throughout the inspection history of the *Conception*, there were no remarks or deficiencies related to the waste receptacles on board.



Figure 18. Left: Photo from a previous voyage of stairway to the upper deck and restrooms of the *Conception*. Note the regular stowage of a polyethylene trash can under the stairway aft of the salon. Right: Still image from a 2019 video taken of the stairway on board the *Conception* with shelving installed. (Source: M. Ryan [left], R. Clevenger [right])

1.6 Accident Damage

Evidence was recovered from the accident site, including equipment and small parts of the hull, and brought ashore, where it was photographed and catalogued by the FBI Evidence Response Team. The wreckage was recovered on September 12 and transported by barge to the NBVC–Port Hueneme on September 13. The Coast Guard; Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF); FBI; and Santa Barbara Fire Department inspected the wreck. All debris and personal effects recovered from the seafloor were also brought to the wreckage site for examination.

On September 25–27, the NTSB examined the wreckage and debris recovered from the seafloor and surface. The wreckage and debris were laid out by the ATF and FBI in a secure parking lot into three sections consisting of the main hull with the below deck spaces, the main deck, and the upper deck (figure 19). There were also bags full of items that had been floating in the water and/or collected from the seabed. The ATF and FBI, with Coast Guard assistance, placed the recovered items and portions of structure that could be identified in their corresponding places for each of the three sections of the wreckage representing the three decks. Identifiable engine room machinery and equipment, such as the generator and sewage tank, were placed back in their original position in the engine room within the hull. For the main deck and upper deck portions, an outline was made on tarpaulin underlays, and the items and structure were placed within the

outlines in the areas where they belonged. Very little structural material remained from the upper deck and the main deck.

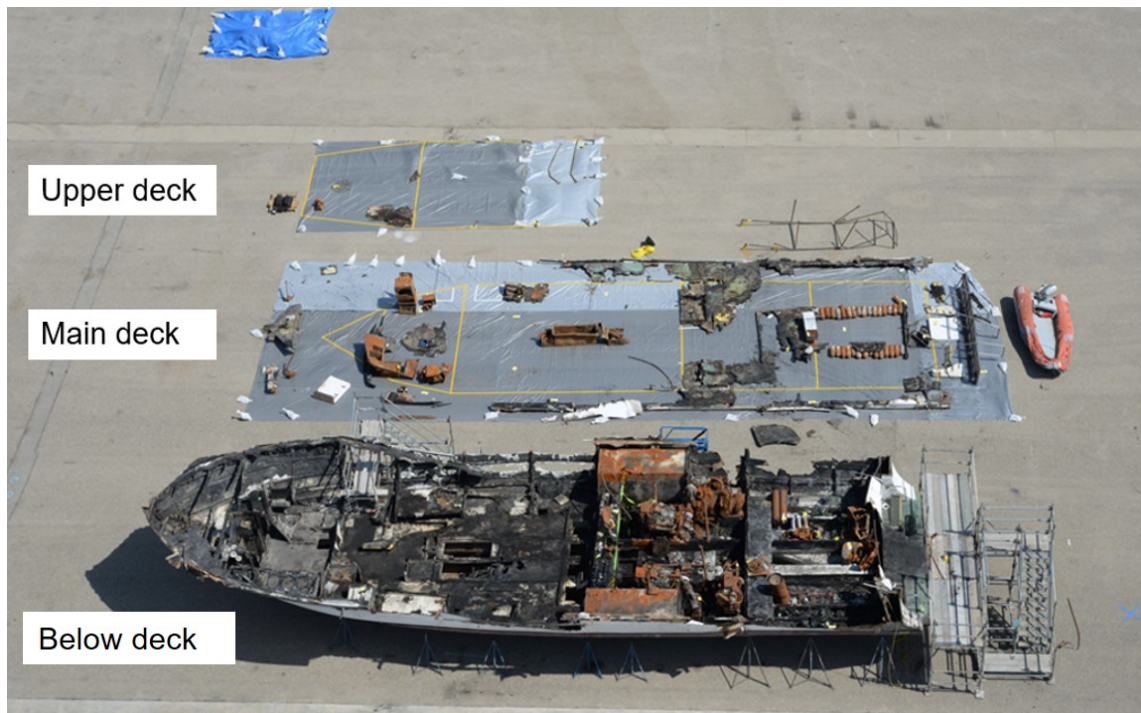


Figure 19. *Conception* wreckage layout at Port Hueneme. (Source: FBI Evidence Response Team)

The hull of the *Conception*, where the below-deck compartments had been located, represented the bulk of the remaining structure. The transverse bulkheads were severely fire damaged, eliminating the separation of the below-deck compartments between the anchor room, shower room, bunkroom, engine room, and lazarette from forward to aft. The entire interior of the below-deck space was charred. Overall, the interior of the below-deck compartments had burned all the way down to the floor in the bunkroom and shower room and had consumed the floor, exposing the longitudinal frames, in both the engine room and lazarette ([figure 20](#)).

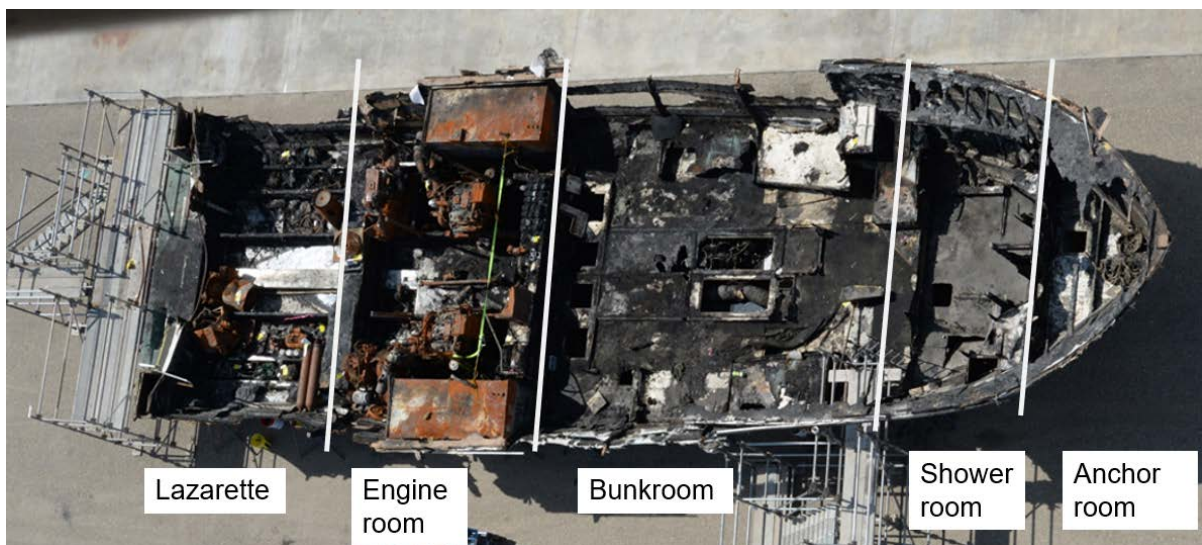


Figure 20. Below-deck areas of the *Conception*. The solid white lines mark the approximate boundaries of each compartment. (Source: FBI Evidence Response Team)

Portside portions of the hull exterior had burned down to a few inches from the waterline. The areas with fire damage closest to the waterline corresponded with the locations of the lazarette compartment and the passenger bunkroom. On the bow portion of the hull exterior, the fire burned down to the level of the main deck rub rails. On the starboard side of the hull exterior, as on the port side, the areas with fire damage closest to the waterline corresponded to the lazarette and passenger bunkroom areas. Overall, the area of lowest burn-through of the hull on the starboard side of the passenger bunkroom was larger than the area of lowest burn-through on the port side.

The structure and items recovered belonging to the main deck of the vessel consisted mostly of a few pieces of partially charred deck material and the noncombustible remains of the galley and salon equipment ([figure 21](#)). The decking material that remained belonged to the three restrooms on the main deck and small portions of the port and starboard walkways that were adjacent to them.

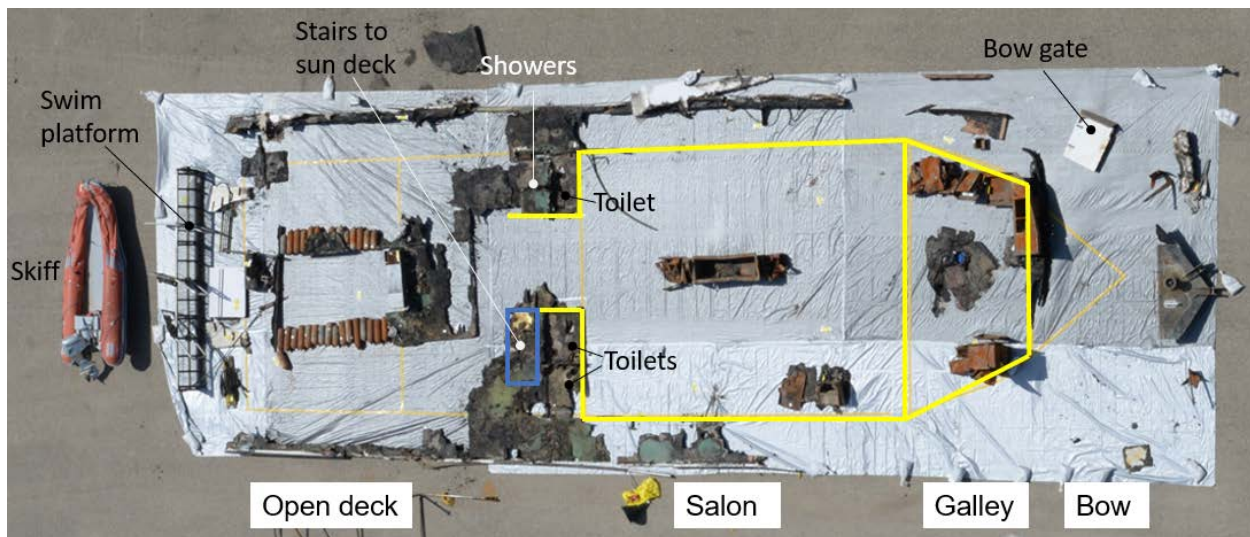


Figure 21. Wreckage belonging to the main deck of the *Conception*. Solid yellow lines indicate the enclosed spaces on the deck. The blue box marks the location of the stairway to the sun deck. (Source: FBI Evidence Response Team)

No recognizable structural components remained from the upper deck, which included the sun deck, crew staterooms, and wheelhouse; some larger items that remained from this deck were the metal frame of the helm wheel, a piece of a life float, and the batteries for the vessel's radios.

Upon examination of the wreckage, investigators found silhouette evidence markings resembling the outline of persons or objects of non-uniform shape (e.g., duffel bags) in the bunkroom at the bottom of the main stairs leading to the salon, on the port side forward lower double bunk, and adjacent vertical and horizontal bunk frames at bunks 17L and 19L ([figure 22](#)).²² The air conditioning intake louver at the bottom of the main stairs had an observable silhouette and traces of human tissue on it.

²² In a fire, when one object is covered by another, it creates a protected area, or silhouette, of that object on the material below.



Figure 22. Postaccident photo of the bunkroom looking from the starboard aisle forward and to port.

1.7 Operations

1.7.1 Charter Company

The accident charterer, Worldwide Diving Adventures, had been in business for about 50 years. The organizer and leader of the chartered trip, also one of the charter company owners, was a passenger on board the *Conception* at the time of the accident. According to Truth Aquatics' owner, the group leader had been "coming out with us for probably 30 years," and many of the group's participants were regular customers. Per the charter agreement, Worldwide Dive Adventures was not responsible for the operation of the *Conception* or its equipment, which was handled by the crew employed by Truth Aquatics.

1.7.2 Company Information

Owner and Operator. Truth Aquatics, a small, family-run company based in Santa Barbara, operated a fleet of three dive vessels, the *Conception*, the *Truth*, and the *Vision*. The business was founded in 1974, and the current owner became a partner in the company in 1979 before eventually assuming full ownership. Ownership of the three vessels was under a trust set up by the owner of Truth Aquatics. In addition to six crewmembers assigned to each vessel, Truth Aquatics employed a shore staff of about ten people to handle logistics, scheduling, and the overall operation of the company.

Current and former employees described the Truth Aquatics' owner as being "very involved" in the operation. According to the company's website, the owner had personally overseen the construction of the *Conception* and the *Vision*. He held a valid Coast Guard merchant mariner credential as a master of self-propelled vessels (not including auxiliary sail) of less than 100 gross register tons upon near coastal waters and occasionally captained the company's vessels.

The company was a member of the Sportfishing Association of California, an industry advocacy and advisory group.²³

According to the company owner and former captains of Truth Aquatics vessels, the captains of the *Conception*, *Vision*, and *Truth* were given broad authority over the operations of their vessels, to include the hiring, training, and dismissal of crewmembers; the conduct of routine maintenance; and the establishment and enforcement of vessel operating procedures. The owner stated that there were no company-wide operating procedures or crew work/rest policies; these were left to the qualified captains of each vessel to establish and manage.

Truth Aquatics was generally well regarded among regulators, current and former employees, customers, and other dive boat operators in Southern California. According to the Assistant Chief, Inspection Division, Coast Guard Sector Los Angeles/Long Beach, Truth Aquatics and the company owner “had a good reputation for being good operators. They were always more than willing to engage in conversation about vessel operations...We’ve always had a good relationship with Truth Aquatics.” A customer who had made several trips on Truth Aquatics vessels stated that the company was “considered to be the top [dive boat] outfitter,” and a former captain of the *Vision* described the vessels as “the safest boats on the coast...No expenses were spared.”

Company Fleet. The *Truth*, built in 1974, was a 64.5-foot-long, 78-gross-ton small passenger vessel, also inspected under Old T regulations. It had a fiberglass-over-wood hull and was smaller and arranged differently than the *Conception*.

The *Vision*, built in 1985, was an 80-foot-long, 98-gross-ton small passenger vessel similar in size and layout to the *Conception* and inspected under the same criteria. After the accident, NTSB investigators visited the *Vision* to inspect construction material, general arrangement, firefighting and lifesaving equipment, means of escape, and egress arrangements. The salon and galley compartment was similarly arranged with the salon area in the aft portion and the galley forward. The passenger bunkroom, which had the same capacity (45 passengers and 1 crew), was also similarly arranged and outfitted with bunkbeds along the centerline and bunkbeds along aisles on the port and starboard sides. As on board the *Conception*, egress from the passenger bunkroom was available from the main staircase near the galley and from an emergency exit hatch above one of the aft bunks. Both exits from the passenger bunkroom led to the salon compartment.

The *Vision*’s bunkroom ventilation system was similar to the system on board the *Conception*. Located in the bunkroom bilge was a six-ton, direct-expansion air conditioning unit, which drew air from within the space through a grille located at the bottom of the stairs and discharged air-conditioned air through a system of ducts to individual bunks and to the passageways on the port and starboard sides of the bunkroom. A single supply fan, rated for 595 cubic feet per minute (cfm), was used to distribute fresh outside air to the bunkroom. Two 480-cfm exhaust fans, one located on each side of the bunkroom, were used to expel air from the space. With passengers on board, the *Vision*, like the *Conception*, operated the bunkroom supply and exhaust fans continuously and used the bunkroom air conditioning unit at night or as needed.

²³ According to the organization’s website, “The Sportfishing Association of California (SAC) was founded in 1972 by industry leaders speaking out on behalf of their interests. SAC works with several agencies and stakeholders, including the California Department of Fish and Wildlife, United States Coast Guard, Navy, National Marine Fisheries Service, Federal Communications Commission, Congress, California Legislature, and the Mexican Government. SAC employees serve on multiple advisory panels in the state and federal arena, and represent industry interests on a variety of topics.” Sportfishing Association of California, www.californiasportfishing.org/about, accessed on April 28, 2020.

Although the passenger bunkroom had smoke detectors, the salon and galley did not. The interior furnishings of the *Vision's* salon were generally the same type and material as those that had been in the *Conception*. The furnishings consisted of wooden tables, plastic chairs, seat cushions and various surfaces sheathed with fiberglass-reinforced plastic (FRP) laminate. These furnishings were not required to be fire-resistant.

Investigators examined the *Vision's* salon for potential ignition sources. There were cable runs located behind the seatback of the bench-type seating and receptacle drops just under the seatbacks. The electrical cable runs were not enclosed in protective conduit, were often not supported, and did not have the appearance of a professional installation. Similar installations were also observed in the bunkroom ([figure 23](#)).



Figure 23. Power cable for lighting routed through ventilation grille in the *Vision's* bunkroom.

1.7.3 Company Loss Control Program

In the 1980s, the International Maritime Organization (IMO) developed the *International Safety Management Code* (ISM Code), the purpose of which is “to provide an international standard for the safe management and operation of ships and for pollution prevention.”²⁴

The ISM Code, along with 33 *CFR* part 96 and Title 46 *US Code* Section 3203 that implement the code for US and other applicable vessels, requires that vessel operators implement a safety management system (SMS). The SMS defines the roles and responsibilities of all personnel, outlines safe practices in vessel operation and navigation, and establishes safeguards against identified risks. According to US law, an SMS must contain the following elements:

1. a safety and environmental protection policy;

²⁴IMO, “ISM Code and Guideline of Implementation of the ISM Code,” <http://www.imo.org/en/OurWork/HumanElement/SafetyManagement/Pages/ISMCode.aspx>, accessed April 6, 2020.

2. instructions and procedures to ensure safe operation of those vessels and protection of the environment in compliance with international and United States law;
3. defined levels of authority and lines of communications between, and among, personnel on shore and on the vessel;
4. procedures for reporting accidents and nonconformities with this chapter;
5. procedures for preparing for and responding to emergency situations; and
6. procedures for internal audits and management reviews of the system.

Truth Aquatics did not have an SMS for its vessels, nor was it required to. Current regulations for SMSs do not apply to small passenger vessels operating on domestic routes. However, the Coast Guard Authorization Act of 2010 authorized the Secretary of the Department of Homeland Security (DHS, in which the Coast Guard operates) to “prescribe regulations which establish a safety management system” for all small passenger vessel operators, including domestic. To date, the Coast Guard has not issued the regulations authorized in the 2010 law; however, the service has signaled its intent to start the development process in the federal government’s Spring 2020 Unified Agenda of Regulatory and Deregulatory Action.²⁵ Additionally, in February 2020, the Coast Guard issued a Marine Safety Information Bulletin (MSIB) encouraging operators to voluntarily implement SMSs and providing references for developing these systems.²⁶

Although Truth Aquatics did not have an SMS, paperwork that was presented to new employees when they were hired by the company included a *Loss Control Program*, which included some elements common to an SMS.²⁷ The first element of the program document, titled “Purpose, Duties, Responsibilities and Administration,” provided an overall safety policy for the company. The policy included the following:

The health and safety of employees and passengers on Truth Aquatics’ property is of critical concern. We strive to attain a high level of safety in all activities and comply with all health and safety laws applicable to our operations. The company expects that every employee will accept the responsibility for loss prevention and reduction.

Captains of each vessel will be directly responsible for maintaining safe working conditions and practices and for the safety of passengers and crewmen under their supervision. They will direct the program to each of their crewmembers in the form of instruction and control. Any safety deficiencies should be brought to the attention of the captain.

All employees have a safety responsibility to themselves, their fellow crewmen, and to the company. Their performance must reflect this mutually beneficial

²⁵ Office of Management and Budget (OMB), “Spring 2020 Unified Agenda of Regulatory and Deregulatory Action, Department of Homeland Security Agency Rule List,” 2020, <https://www.reginfo.gov/public/do/eAgendaMain>.

²⁶ (a) An MSIB is a Coast Guard publication that provides a brief, concise, and timely notice of changes in the maritime transportation system, usually to provide guidance to industry on how to comply with new requirements and/or address evolving operational hazards. MSIBs are announced through various press and social media outlets and are available online at <https://www.dco.uscg.mil/Featured-Content/Mariners/Marine-Safety-Information-Bulletins-MSIB/>. (b) Coast Guard, *Resources for Voluntarily Establishing a Safety Management System*, MSIB 03-20, Washington DC: Department of Homeland Security, 2020.

²⁷ *Loss control* is an insurance industry term for a program to manage risk and reduce losses.

obligation through active support of the safety and loss control program and compliance with established safety practices and procedures. The captains will provide training and instruction to help meet these responsibilities.

Follow-on sections of the document included instructions for the conduct of inspections for safety hazards, accident investigation and reporting requirements, and guidance for annual safety meetings between vessel captains, management, and the owner.

The fifth element of the program, "Training," stated the following:

Truth Aquatics will provide adequate training to all employees so that they can perform their assigned tasks. Training programs shall be performed by captains on an as-needed basis. Records shall be kept of meeting agendas and attendance. Management shall maintain these records in the [company's shoreside] office and they will be made available to all employees.

Annual CPR training classes will be held at appropriate times and all crewmembers are encouraged to attend.

The final element of the *Loss Control Program*, "Emergency Procedures," contained a list of nine emergencies, including fires, flooding, and abandon ship, with step-by-step instructions for crew responses to each emergency. The section lead paragraph stated, "This list is required to be reviewed by all participants." The first procedure on the list was firefighting and consisted of the following instructions:

- Shut off all engines, generators and ventilation systems, unless they are needed to maneuver the vessel.
- Recover and evacuate anyone injured.
- Locate the fire and evaluate the extent of the fire.
- Cut off air supply to fire – close items such as hatches, ports, doors, ventilators, louvers, and shut off power ventilation system (blowers).
- Cut off electrical system supplying affected compartment if possible.
- If safe, immediately use portable fire extinguishers at base of flames for flammable liquid or grease fires, or water for fires in ordinary combustible materials. Do not use water on electrical fires.
- If fire is in machinery spaces, shut off fuel supply and ventilation, and activate fixed extinguishing system.
- Maneuver vessel to minimize effect of wind on fire.
- If unable to control fire, immediately notify the Coast Guard and other craft in the vicinity by radiotelephone (VHF).
- Move passengers away from fire, have them put on lifejackets, and if necessary, prepare to **abandon ship** [emphasis in original].

The employee handbook stated, "The Loss Control Program manual is designed for the safety of all employees. You are responsible for reading this manual and are required to sign and date that you have read and understand it." The second captain, first galley hand, and an alternate second captain who had been on *Conception* during the previous voyage stated that they had received a copy of the *Loss Control Program*, as well as an employee handbook and other documents, after being hired by Truth Aquatics. The second captain and alternate second captain

(who had been hired in August 2019) stated that they had received the documents in an email with attachments.

The alternate second captain stated that he had reviewed the program document, but that no one verified that he had read it or understood the policies and procedures before he got under way on the *Conception*. The first galley hand stated that he did not receive the new employment documents until just prior to the accident voyage, his fifth or sixth voyage on the vessel. He stated that he wrote down the headings of the emergency procedures listed in the *Loss Control Program* and asked the captain to discuss the procedures on the day before the accident. The first galley hand stated that the captain's response was, "When we have time." He further said that during the accident, "I didn't know what the procedures were supposed to be."

1.7.4 Watchstanding

Truth Aquatics' owner stated that there were no company-wide policies or procedures regarding watchstanding on board its vessels; watches were at the discretion of the captain of each dive boat. *Conception* crewmembers and former crewmembers interviewed by investigators stated that there was no formal watch rotation for the vessel.

Navigation Watches. Per New T regulations (all vessels), "the movement of vessel shall be under the direction and control of the master or a licensed mate at all times." (The terms "licensed" as used in this section of Subchapter T is equivalent to "credentialled" as used in this report and other portions of 46 *CFR*.) The captain of the *Conception* was the principal operator of the vessel's controls, and during the accident voyage the credentialled second captain also took the helm for brief periods.

In an interview with law enforcement officials, the first deckhand stated that, on previous voyages, the deckhands would also be assigned helm watches at night. When a deckhand had the watch, all other crewmembers were asleep, including the captain and second captain. He said that the captain would "strategically pick the legs that the deckhands would take so that we're not going to be crossing the channel, or intercepting islands, or basically anything like that." The deckhands were instructed to monitor the radar, the VHF radio, and the electronic charting system and to wake up the captain if the engines made unusual noises or if other vessels came within 2 miles of the *Conception*. (There is no requirement in New or Old T to maintain a wheelhouse watch while a vessel is at anchor.)

Roving Patrols. The requirement to keep a watch at night while passengers are embarked on a vessel has been codified in US law since 1871. Per the current statute (46 *United States Code [USC]* Section 8102), "the owner, operator, or charterer of a vessel carrying passengers during the nighttime shall keep a suitable number of watchmen in the vicinity of cabins or staterooms and on each deck to guard against and give alarm in case of fire or other danger." An owner, operator, or charterer who fails to comply with this law is subject to a civil penalty of \$1,000. In interpreting the statute for small passenger vessels under New T regulations (all vessels), the Coast Guard requires that a "suitable number of watchmen patrol throughout the vessel during the nighttime, whether or not the vessel is underway, to guard against, and give alarm in case of, a fire, man overboard, or other dangerous situation."

As a result, a provision was included in the "Route Permitted And Conditions of Operation" section of the *Conception*'s COI stating that "a member of the vessel's crew shall be designated by the master as a roving patrol at all times, whether or not the vessel is underway, when the passenger's [*sic*] bunks are occupied." NTSB investigators reviewed COIs from other small

passenger vessels with overnight accommodations, and all of the certificates had a similar statement regarding the requirement for a roving patrol, both under way and not under way.

When the *Conception* was not under way, whether moored in harbor in Santa Barbara or anchored around the Channel Islands, there was no designated roving patrol while passengers were aboard, according to crewmembers and former crewmembers. When passengers boarded the vessel the night before an early departure, it was common for there to be no crew on board until hours after the passengers had arrived. While on a dive trip and at anchor, no watch was set at night, and all crewmembers normally slept after the day's activities had ended until the next morning.

The NTSB interviewed captains and crewmembers from other Truth Aquatics vessels, and all stated that the practices on their vessels were the same as those on the *Conception*. A captain of the *Vision* stated, "We'd prep the boat the day before, and then leave the boat open for the passengers to board...all of the deck crew would arrive a half hour before our scheduled departure." No watches were set while in port or at anchor. The *Vision* captain stated that he believed that having one of the crew sleep in the bunkroom "somehow fulfilled" the roving patrol requirement. He said that he had followed the practice that was shown to him when he began working for Truth Aquatics, and he thought "the boat's been operating this way for so long successfully after so many inspections that it must be fine." Referring to the roving patrol requirement, a former captain of the *Truth* told *Los Angeles Times* reporters, "It's a regulation, but it wasn't really followed."²⁸

After the accident, NTSB staff visited other dive boats operating in Southern California waters to gather information about industry-wide practices. During informal discussions with investigators, the owners and operators of all vessels that were visited stated that crewmembers were aboard the vessel and night watches were conducted when passengers were embarked. However, procedures for the conduct of night watches varied from boat to boat, ranging from active roving patrols to stationary watches located in the wheelhouse or salon.

When asked by NTSB investigators, Coast Guard representatives stated that during inspections for certification and annual inspections, inspectors have no practical way of verifying that operators were complying with the requirement for a roving patrol on small passenger vessels with overnight passengers. A Coast Guard senior marine inspector stated, "The master of the vessel is responsible for operating the vessel within the parameters on the certificate. But there's no way during an inspection to know, because the inspection is conducted dockside, and even if you took the vessel out to do drills, it wouldn't be with passengers." Neither the CG-840 TI inspection book nor MSD Santa Barbara's "Small Passenger Vessel – T" checklist included a line item for verifying that a roving patrol was being conducted. Coast Guard records show that, nationwide since 1991, no citations have been issued and no fines have been levied for failure to post a night watch or roving patrol.

1.8 Survival Factors

The 33 passengers on board the *Conception* at the time of the accident were all United States citizens from various states across the country. Passenger ages ranged from 16 to 62 years old.

²⁸ Puente, Mark, Richard Winton, Leila Miller, "Before *Conception* boat fire, captains say Coast Guard safety rule was ignored," *The Los Angeles Times*, December 30, 2019.

1.8.1 Station Bill

Per New T regulations (all vessels), the *Conception* had a station bill—an official list of each crewmember’s assigned duties and watch station—which outlined instructions to the crew in case of emergency situations involving man overboard, fire at sea, and rough weather or crossing hazardous bars. The station bill for the *Conception* was not found in the wreckage; however, the two other vessels in the Truth Aquatics fleet, the *Vision* and *Truth*, had the same station bill as the *Conception*.

For onboard fires, the station bill required the second captain to cut off air supply to the fire and close hatches, ports, doors, and ventilation dampers, while the first deckhand was to use portable fire extinguishers to extinguish the fire. The second deckhand was tasked to shut off the fuel supply and ventilation to the engine room and discharge the system for any fire in machinery space. The captain’s task was to minimize the effect of wind on the fire and to immediately notify the Coast Guard and other boats in the vicinity if the fire was unable to be controlled. The second captain was also responsible for moving passengers away from the fire, having them don lifejackets, and, if necessary, have them prepare to abandon ship. There were no specific emergency duties assigned to the first or second galley hands. Additional procedures were discussed in Truth Aquatics *Loss Control Program*.

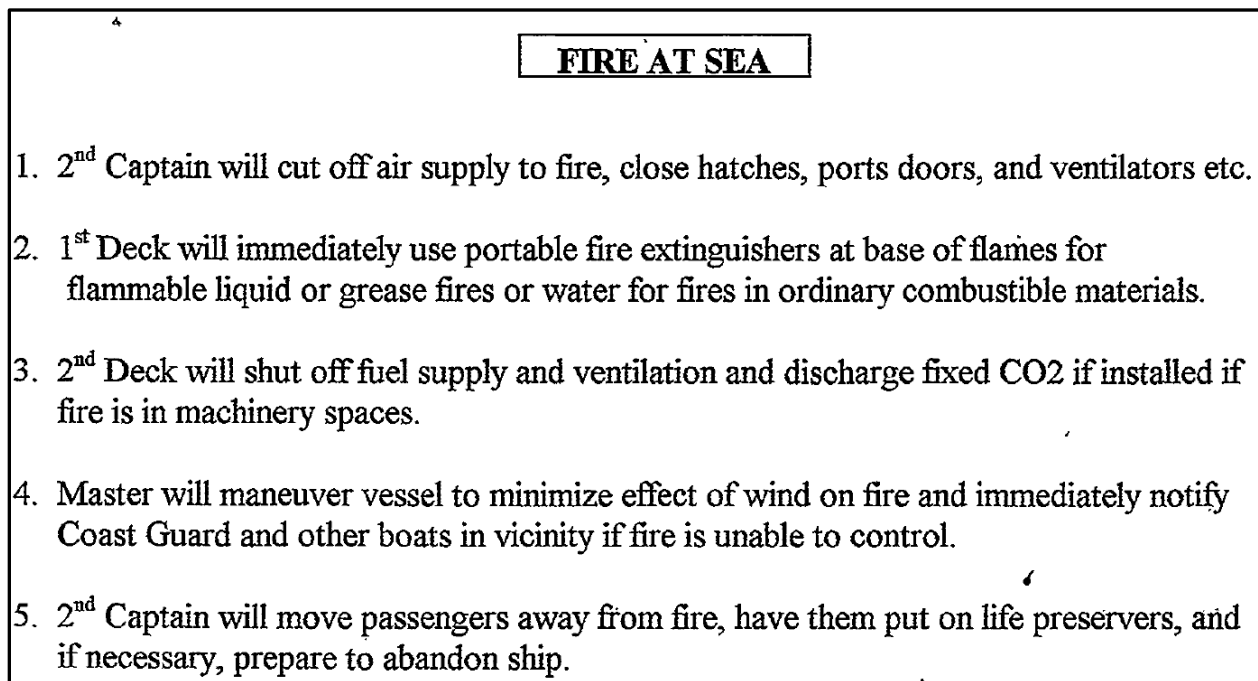


Figure 24. Fire at sea emergency instructions/station bill from the *Vision*.

Although the station bill was required to be posted by regulation, none of the crewmembers on the *Conception* at the time of the accident were aware of any posted station bill. The first galley hand was unfamiliar with the concept of a station bill when asked by investigators. The second captain stated that he understood that his role in a fire emergency was to start the fire pump and/or launch the skiff.

The *Conception* was fitted with a fixed installation public address (PA) system that could be used to alert passengers and crew of an emergency from the wheelhouse, with speakers on the bow, stern, and in the bunkroom. Regulations required the fixed PA system to be audible during

normal operating conditions in passenger accommodation spaces and all other spaces normally manned by crewmembers.²⁹ Although there was a speaker for the PA system in the bunkroom, it was reported to have been disconnected so that passengers who were sleeping would not be interrupted by routine announcements. There were no pre-accident records from the Coast Guard showing whether the PA system on board the *Conception* was checked during inspections or any deficiencies noted. During an inspection after the accident, the Coast Guard found that the PA system on board the *Vision* was disconnected in the passenger bunkroom, and inspectors issued a deficiency requiring it to be rectified.

1.8.2 Passenger Manifest and Accountability

New T regulations (all vessels) require the owner, charterer, managing operator, or master of a vessel to “keep a correct list of the names of all persons that embark on and disembark from a vessel...where passengers are carried overnight.” The list “must be communicated verbally or in writing ashore at the vessel’s normal berthing location or with a representative of the owner or managing operator of the vessel.”

On the *Conception*, a handwritten crew and passenger list was kept on board the vessel, and a copy of the list for the accident voyage was found in the company office ashore. Passengers were required to write their own names on the list after boarding, and some of the names appeared to be signatures, making them difficult to read. The list had the names of 32 passengers; the name of 1 passenger was missing (the owner of Truth Aquatics was able to provide an up-to-date list of passengers after the accident). No emergency contact information was required to be given by any of the passengers.

1.8.3 Safety Briefing

Passenger safety orientations are required on small passenger vessels by New T regulations (all vessels). The regulations require that the orientation be conducted “before getting underway on a voyage or as soon as practicable thereafter.” Among several required topics, the orientation must include a briefing on the location of emergency exits and a demonstration of life jacket donning or instructions that passengers may contact a crewmember for a demonstration. The regulations also required that passengers “shall be requested to don life jackets and go to the appropriate embarkation station during the safety orientation for vessels on a voyage of over 24 hours.”

Crewmembers told investigators that the 15–20-minute safety briefing on the *Conception* was conducted by the crew following a standard bullet-point script. For trips that began late at night or early in the morning, such as the accident voyage, the safety briefing was normally conducted following breakfast, after the vessel had anchored at the first dive site. All passengers were required to attend. Former passengers confirmed that during the briefing, the location of the bunkroom escape hatch was discussed, as the briefer normally stood directly aft of the hatch in the salon during the presentation. Passengers were informed but not shown where the hatch was located in the bunkroom. According to current and former crewmembers, the briefer did not demonstrate donning of lifejackets. During interviews with investigators, current and former

²⁹ According to 46 *CFR* 175.400, accommodation spaces include those spaces used as a public space, dining room or mess room, lounge or café; overnight accommodation space; or washroom or toilet space. On board the *Conception*, the accommodation spaces included the salon, bunkroom, and shower room.

crewmembers on other Truth Aquatics vessels confirmed that the safety orientation procedures on their vessels were the same or similar to the procedures on the *Conception*.

On the evening of August 30, passengers boarded the vessel and went to their assigned bunks to sleep. The *Conception* got under way from Santa Barbara about 0404 on August 31. Sometime after 0830 that morning, after the *Conception* anchored at the initial diving site, the first deckhand completed the safety orientation in the salon. The first deckhand stated that he briefed passengers on the location of lifejackets, extinguishers, and escape routes but was interrupted when a passenger fainted. According to crewmembers' accounts of the safety brief on the accident voyage, the passengers on the *Conception* were not requested to don lifejackets or muster at the embarkation station. After the passenger was revived and his vital signs checked, the remainder of the safety brief was conducted by the captain, who, according to the deckhand, provided "an abridged version" of the dive safety section of the brief.

As an alternative to the safety orientation announcements, New T regulations (all vessels) permitted the use of a card or pamphlet, delivered to each passenger before getting under way, with the information that would have been provided in a safety briefing. If using the pamphlet, an abbreviated announcement must be made prior to getting under way. A "Welcome Aboard" card was available in the *Conception* salon, containing general information that would "serve as your pre-departure safety briefing," as well as the location of lifesaving equipment. Placards in each bunk provided lifejacket donning instructions. During interviews, surviving crewmembers did not report that an announcement was made prior to getting under way for the accident voyage.

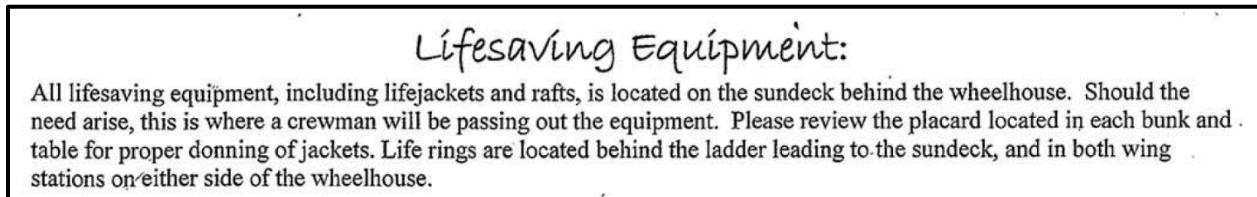


Figure 25. Truth Aquatics "Welcome Aboard" information specific to pre-departure safety briefing. (Source: Truth Aquatics)

In the months prior to the accident, Truth Aquatics was finalizing the production of a vessel and safety orientation video that was intended to be shown on board both the *Vision* and *Conception*, which were similar in layout. The video had been completed by the contractor tasked with production but was not yet in place on board each vessel. The safety orientation video showed how to don a lifejacket, the locations of the muster area and of lifesaving appliances, instructions for a man overboard, and the locations of the emergency escape hatch from the bunk room and salon.

1.8.4 Smoke Detectors and Firefighting Equipment

According to the Coast Guard, the *Conception* was in compliance with the applicable regulations pertaining to fire safety for this class of vessel.

Smoke Detectors. New T regulations (all vessels) specified that "each overnight accommodation space on a vessel with overnight accommodations for passengers must be fitted with an independent modular smoke detection and alarm unit." The smoke detection and alarm system was further required to:

- (1) Meet UL 217 (incorporated by reference, see 46 *CFR* 175.600) and be listed as a ‘Single Station Smoke detector—Also suitable for use in Recreational Vehicles,’ or other standard specified by the Commandant;
- (2) Contain an independent power source; and
- (3) Alarm on low power.³⁰

Neither Old T nor New T regulations required the salon and galley compartment to have smoke detectors installed. Heat detectors were installed in the engine room and galley. The smoke and heat detectors were not interconnected to other alarms or a central operating station in the wheelhouse. In the engine room, the heat detector, if activated, would initiate the carbon dioxide fixed fire-extinguishing system for the engine room. The galley detector was not connected to the range hood fan or any damper, nor was it required to be.



Figure 26. Photo of the galley of the *Conception* taken from the forward centerline window. (Source: NTSB eyewitness submission)

As required by 46 *CFR* 181.405(c), which applied retroactively to existing vessels with an overnight accommodation space, the bunkroom area contained two independent modular smoke detectors, installed in the overhead on the port and starboard aisles between the bunks. Investigators were informed by the vessel owner that the smoke detectors in the bunkroom were hardwired into the vessel’s electrical system, with a 9-volt battery backup. The smoke detectors were not interconnected to other alarms or a centralized system in the wheelhouse. Based on photos and video, the smoke detectors appeared to be common consumer-type smoke detectors, as specified in the regulations. The smoke detectors in the bunkroom were the only ones required to be on board. There were no additional smoke detectors installed on board.

³⁰ (a) UL 217 is an industry standard describing the basic requirements and minimum performance characteristics of single and multiple station smoke detectors used in ordinary indoor locations. (b) In contrast, the regulations in 46 *CFR* Subchapter K, applicable to larger US-flagged passenger vessels, require accommodation, control, and service spaces to have a “smoke actuated fire detection system” and “a manual alarm system.”



Figure 27. Interior view of *Conception* bunkroom. (Source: Truth Aquatics; annotated by NTSB)

There were no requirements related to the testing and inspection of smoke detectors. The owner was aware that the bunkroom smoke detectors functioned properly less than a month before the accident voyage, when a contractor soldering on the air conditioning unit activated them. The owner told investigators that after the smoke detectors activated, the captain of the *Conception* “unplugged” them while the soldering was ongoing. When the work was completed, the smoke detectors were plugged back in, “fresh” batteries were added, and the detectors were tested. When asked whether there were routine inspections or testing of the smoke detectors on the *Conception*, the owner stated the captain was responsible for any inspections or testing.

At the time of the accident, the second galley hand stated that he did not hear any alarms, nor did he smell smoke from his bunk aft of the wheelhouse. The first deckhand, whose bunk was also in the wheelhouse, said that he heard a faint alarm when he was awakened. He did not recognize the alarm and described it as “coming from the dash [in the wheelhouse]...barely a little chirp.” He further noted that when he looked, he did not notice anything flashing on the console in the wheelhouse.

Fixed Fire-Extinguishing Systems. New T regulations included fixed fire-extinguishing requirements for a number of spaces, including most engine rooms. Existing wooden vessels, such as the *Conception*, were required to comply with the new regulations by March 1999.

In accordance with the New T regulations (all vessels), the engine room was equipped with an approved fixed fire-extinguishing system. Two 75-pound fixed cylinders charged with carbon dioxide could be activated automatically via heat sensors located above the main engines or remotely at a pull station positioned on the port side of the aft main deck. Once activated, the system would flood the engine room with carbon dioxide. The carbon dioxide bottles were located on the forward bulkhead in the lazarette, starboard side. The fire-extinguishing system and ventilation dampers for the engine room were not activated manually on the night of the fire.

A third-party inspection of the engine room fixed fire-fighting system and extinguishers was completed in February 2019, and no outstanding deficiencies were noted.

The *Conception's* galley had a flat griddle for which regulations prescribed a fixed fire-extinguishing system. Due to the short 14-inch ducting that led directly outside, in 2000, the Coast Guard granted a waiver for the system contingent on the company providing an additional B-II extinguisher (10-pound dry chemical) in the galley, installing a heat detector, and implementing a maintenance program "to ensure the existing galley and ventilation equipment is kept free from any build-up of grease." The second galley hand told investigators it was his duty to clean the grease trap.

According to the owner, the captains for each vessel in the fleet were responsible for all maintenance on board the vessel and all maintenance records were kept on each vessel.

Firefighting Equipment. The *Conception* used a combination of fire extinguishers, a fire pump, and a fire axe to meet the fire equipment carriage regulations. There was no additional fire equipment on board in excess of the requirements.

In total, there were six fire extinguishers on board the *Conception*. According to the COI, five of them were type B-II and one was type B-I (2-pound dry chemical). On the main deck, one fire extinguisher was mounted in the galley by the coffee pot, and one was mounted port side aft in the salon. In the bunkroom, there was a fire extinguisher mounted on a bulkhead across from the main stairs by the changing room. There was one fire extinguisher in the engine room, one in the lazarette, and one in the wheelhouse dash at the console.

An electrically driven fire pump in the engine room provided firefighting water to hoses at two fire stations located on the main deck on either side, outboard of the salon. Each fire station contained 50 feet of 1.5-inch fire hose. The fire pump could be activated from two locations: locally at the motor controller and remotely from the vessel's port fire station. Crewmembers on board at the time of the accident stated that the fire pump was tested daily to ensure performance and maintain the pump's readiness.

On September 1, the day before the fire, the sewage holding tank had overflowed into the port bilge, and the first deckhand attempted to use the bilge pump to clean up. The bilge pump was inoperable, so the deckhand lined up the fire pump to finish cleaning. He told investigators that after the clean-up, before leaving the engine room, he lined up the fire pump so that it was ready for use. The fire hoses were tested annually during Coast Guard inspections.

A single fire axe, as required by regulations, was stowed on the aft bulkhead of the wheelhouse.

The Coast Guard documented a total of 31 deficiencies on the *Conception* from 2009-2019, 4 of which were related to fire protection, including the fire pump, galley heat detector, hose, and wheelhouse extinguisher, all of which were rectified to the Coast Guard's satisfaction.

1.8.5 Means of Escape and Egress

When the *Conception* was constructed and underwent sea trials in 1981, the Coast Guard "Sea Trials; T new construction and conversion" inspection form required the attending Coast Guard inspector to "physically use each emergency escape on board." The inspection item was checked as completed on the form. The inspector wrote on the signed form that the sea trials were satisfactory.

As an existing vessel, the *Conception* was required to meet the Old T standards for means of escape and emergency egress, which required that “not less than two avenues of escape from all general areas accessible to the passengers or where the crew may be quartered or normally employed, so located that if one is not available the other may be.” The New T regulations in 46 *CFR* 177.15-1, which did not apply to the *Conception*, further require the means of escape to be sufficient for rapid evacuation in an emergency for the number of persons served. Investigators were unable to find a quantitative definition of the word “rapid.” Although there was no specific minimum dimension guidance in either Old or New T regulations regarding means of escape, New T regulations state the “dimensions of the means of escape must be such as to allow for easy movement of persons wearing lifejackets and that there must be no protrusions that could cause injury, ensnare clothing, or damage lifejackets.”

From the *Conception*'s bunkroom, there were two means of escape, both leading to the salon above: (1) the spiral stairs forward in the bunkroom ([figure 28](#)), and (2) the escape hatch installed centerline at the aft end of the bunkroom ([figure 29](#)). The hatch, marked with a two-inch plastic sign, was accessible from either aisle by climbing a wooden ladder, located in the corner where the aftermost middle and aft athwartship tiers of bunks were, onto the upper bunk; crawling to the centerline; and then pushing the plywood escape hatch up and out of the way. The hatch opened below the centerline countertop in the salon. Investigators measured the *Vision*'s escape hatch, which, according to the owner, was similar to the *Conception*'s escape hatch. The opening dimensions were approximately 22 inches by 22 inches through the main deck, with the aft-facing vertical opening having a clearance of about 35 inches from the main deck to the countertop above, or 28 inches from the top of the 7-inch main deck coaming. The two means of escape were at opposite ends of the bunkroom (so as to minimize the possibility of one incident blocking both escapes) and did not pass through a watertight door, thereby fulfilling the regulations applicable to the *Conception*. In the available documentation and inspection history of the vessel, no deficiencies or modifications were found related to the emergency escape hatch or the bunk ladders to the hatch.



Figure 28. Staircase from the main deck galley/salon leading down to the bunkroom on the *Conception*. (Source: NTSB eyewitness submission)



Figure 29. The *Conception* bunkroom escape hatch from above in the salon (left) and in the bunkroom from the port side (right). (Source: R. Clevenger [left]; Truth Aquatics [right], annotated by NTSB)

The salon compartment of the *Conception* had three means of escape—the main doors aft in the salon, the forwardmost sliding window on the port side, and the middle sliding window on the starboard side of the salon. If closed, the windows latched and could not be opened from the exterior walkways.

1.8.6 Lifesaving Appliances

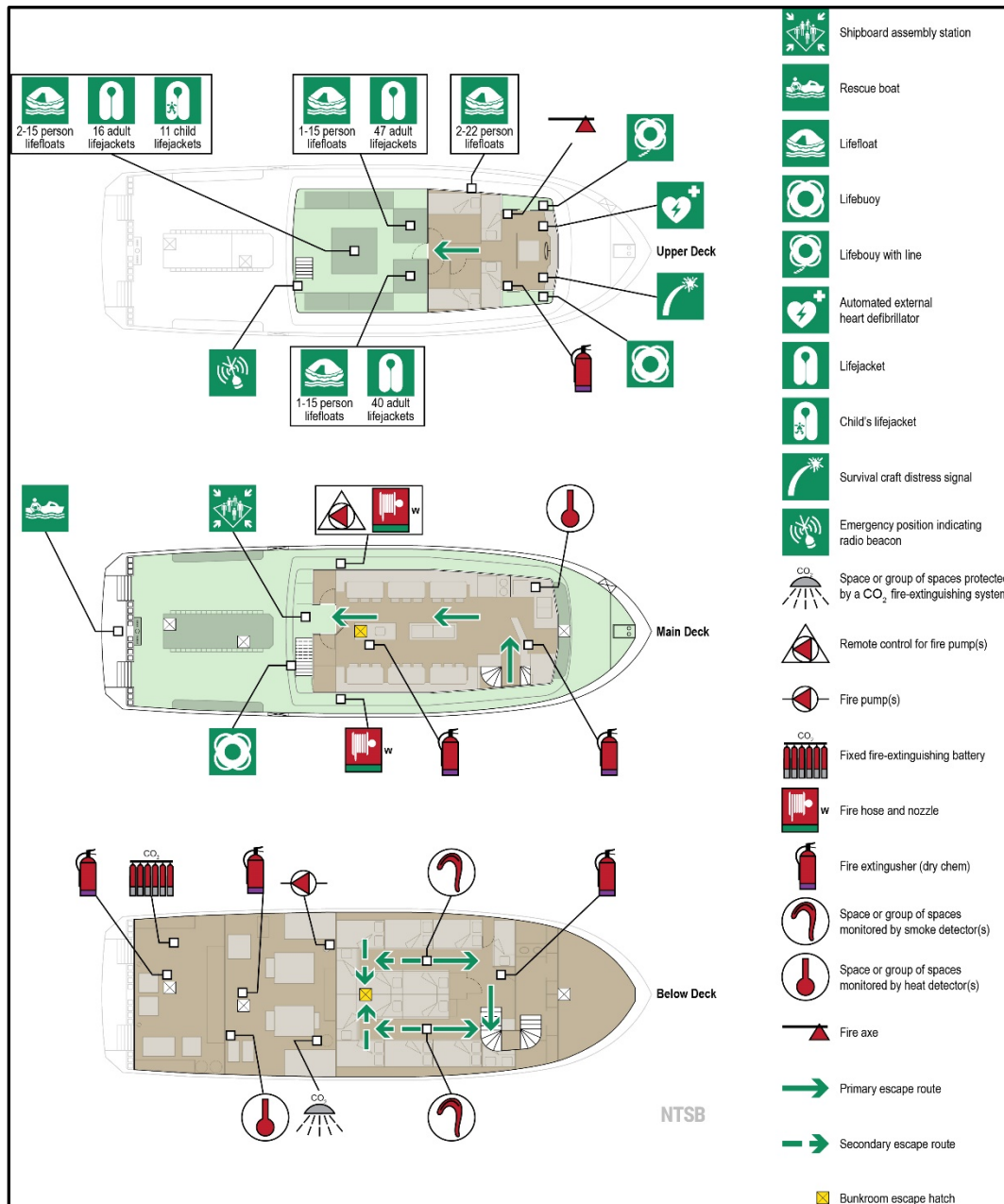


Figure 30. Locations of firefighting equipment, lifesaving appliances, and evacuation plan for the *Conception* at the time of the accident (compiled from the investigation and drawn by the NTSB).

The primary lifesaving appliances aboard the *Conception* included 6 various-sized life floats, with an aggregate capacity of 104, or 100 percent of the people allowed on board. All lifesaving appliances were located either on the upper deck or on top of the wheelhouse.

Per its COI, the vessel was required to carry Type I offshore lifejackets for 103 adults and 11 children. All Type I lifejackets were stowed on the upper deck in boxes with float-free covers. According to the station bill on the *Conception*, the second captain was responsible for ensuring passengers donned their lifejackets in an emergency.

The crew was unable to retrieve any lifesaving equipment before abandoning ship, and all equipment was consumed in the fire. Investigators were not able to examine the *Conception's* lifesaving equipment; only pieces survived the fire. The largest piece recovered was a corner of a life float.

The *Conception* was also required to have a rescue boat. The skiff served as the vessel's designated rescue boat. The 16-foot Caribe UB15 rigid-hull inflatable, equipped with a 40-hp Honda 4-stroke outboard engine, was capable of carrying up to 8 people. The skiff was primarily used to support diving operations but was also intended to be used to retrieve persons overboard. It was stowed on the raised swim platform at the stern when not in use.

The *Conception* had a Category I float-free Emergency Position Indicating Radio Beacon (EPIRB), which was mounted on the upper deck bulwark on the starboard side, near the top of stairs to the main deck. The surviving crew of the *Conception* did not retrieve or manually activate the EPIRB, and the EPIRB was destroyed in the fire; there were no signals received by the Coast Guard.

Medical equipment, including a first aid kit, oxygen, and an automated external defibrillator were stowed under the wheelhouse console. The *Conception* also had flares that were reported to be located in the wheelhouse. None of this equipment was retrieved or used in the accident.

1.8.7 Emergency Drills

New T regulations (all vessels) require the master of a small passenger vessel to “conduct sufficient drills to make sure that all crew members are familiar with their duties” in the event of a man overboard, an emergency necessitating abandoning ship, or a fire. The regulations do not specify the frequency that the drills must be conducted but state that the drills shall include a muster of the passengers and reporting of the crew to assigned stations and preparation for assigned duties. Man-overboard and abandon ship drills must include checking that life preservers are properly donned and instruction in the automatic or manual deployment of survival craft. Fire drills must include a demonstration of assigned duties by the crew and instruction in the use of fire alarms, extinguishers, and any other firefighting equipment on board. Required drills must be logged and include the date of the drill and a general description of the drill scenario or training topics.



Figure 31. Postaccident photo of the *Conception* skiff.

According to the Truth Aquatics owner, logs for drills and other training activities on the *Conception* were kept on the vessel. No logbooks were found after the accident—the wheelhouse where the logs were stored was destroyed by the fire. During a 2017 Coast Guard annual inspection of the *Conception*, inspectors noted that the drill log was not up to date. The inspectors cleared the discrepancy once underway drills were completed and logged. No other discrepancies with logs or the conduct of drills were noted by inspectors in the 5 years prior to the accident.

The second captain, first deckhand, and second galley hand told investigators that they had not participated in a fire drill aboard the *Conception*. The first deckhand stated that he had never pulled out a fire hose on the vessel and had “never done a dry run on anything, with the exception of during the Coast Guard inspections.” He stated that he had participated in one fire drill on another Truth Aquatics vessel during a Coast Guard inspection, and the drill log for the *Truth* reflected his participation in a drill during an April 2019 inspection of that vessel. A former first galley hand stated that the crew had pulled out fire hoses during a training session while she was on the *Conception*. Other former crewmembers told investigators that they had never participated in a fire drill.

1.9 Personnel Information

By regulation, the *Conception* was required to have four crew, with two being credentialled mariners. The vessel normally operated with six crew, including a captain and second captain, two deckhands, and two galley hands. During overnight voyages, the second captain and first deckhand slept in the wheelhouse bunks, the galley hands slept in the two-bunk stateroom, and the captain slept in the single-bunk stateroom. The second deckhand slept below in the passenger bunkroom.

1.9.1 Crew Recruitment and Training

Current and former crewmembers interviewed by NTSB investigators described the hiring and training process for employees on board Truth Aquatics vessels. A prospective employee was first invited to participate in a voyage without pay. During this voyage, the prospective employee was provided the opportunity to interact with and work alongside the crew, and the captain evaluated the person to determine whether they would be a “good fit.” Upon completion of the unpaid voyage and a negative drug test, a suitable candidate was offered a job if there was an opening on the vessel. Once hired, the new employee began work immediately in their assigned position. Current and former crewmembers stated that there was no formal training (company-wide or aboard the vessel) for new employees prior to getting under way as a paid employee. All training was on-the-job instruction by the vessel’s crew.

New T regulations (all vessels) require the owner, operator, or master of a small passenger vessel to “instruct each crew member, upon first being employed and prior to getting underway for the first time on a particular vessel and at least once every three months, as to the duties that the crew member is expected to perform in an emergency including, but not limited to, the emergency instructions listed on the emergency instruction placard.” For small passenger vessels, the emergency instruction placard must include the actions to be taken in the event of fire, heavy weather, or man overboard. Training of crewmembers must be logged or otherwise recorded.

Conception crewmembers stated that, with the exception of first aid and cardiopulmonary resuscitation (CPR) training, the captain conducted training with new employees individually, showing the new employee where various equipment was located, how to align the fire pump, and other normal operating and emergency procedures. Experienced crewmembers also conducted

informal training with the new employees. Training was conducted when time allowed during normal commercial operations of the vessel. For first aid and CPR, Truth Aquatics provided training to company employees annually.

Coast Guard inspectors told investigators that they validated compliance with periodic training regulations by reviewing the required training logs and evaluating proficiency during drills conducted at inspections. Coast Guard records show that, nationwide since 1991, fourteen small passenger vessel owners, operators, or charterers have been cited for failure to conduct or properly record crew training in accordance with regulations. Truth Aquatics was not among the cited operators.

1.9.2 Crew Licensing and Certification

Captain. The 65-year-old captain of the *Conception* held a valid merchant mariner credential as a master of self-propelled vessels (not including auxiliary sail) of less than 100 gross register tons upon near coastal waters. He had worked for Truth Aquatics since 1984 (with a 3-year hiatus in the late 1990s), starting as a deckhand and then rising to captain in 1985 once he had obtained his 100-ton master's credential. According to Truth Aquatics and Coast Guard documents, he had captained all three of the company's vessels, but was primarily assigned to the *Conception* throughout his 3 decades of employment.

The captain was in overall charge of the vessel. Crewmembers, both current and former, told investigators that the captain was the primary operator of the helm and engine controls, turning over to the second captain or first deckhand for two-hour periods when transiting at night, or for short periods during the day for breaks.

Second Captain. The 28-year-old second captain held a valid merchant mariner credential, issued on March 19, 2019, as a master of self-propelled vessels (not including auxiliary sail) of less than 100 gross register tons upon near coastal waters. He told investigators that he had been hired by Truth Aquatics in late June or early July 2019 and that this was his first job as a credentialed mariner. Prior to this position, he had worked as a deckhand on several boats operating off the Southern California coast and the Channel Islands from 2017 to 2019.

The second captain stated that, as a new crewmember, his duties were primarily deck related, including working with the deckhands to anchor the vessel, launch and recover the skiff, and conduct general cleaning. He said that on the accident voyage, the captain had allowed him to spend more time at the controls in the wheelhouse so that he could gain experience with maneuvering the vessel.

First Deckhand. The 28-year-old first deckhand had been employed by Truth Aquatics on board the *Conception* since November 2018. He did not hold, nor was he required to hold, a merchant mariner credential. He told investigators that he held an American Sailing Association certification for bareboat cruising, and, for the 3 years prior to being hired by Truth Aquatics, he had worked aboard a 70-foot sailing vessel that conducted 2-hour passenger cruises in Monterey Bay, California.

The first deckhand's duties included line and anchor chain handling, monitoring engineering equipment and diving compressors, filling scuba diving tanks, monitoring and assisting divers, operating the skiff, minor maintenance, pumping bilges, general cleaning, and occasional turns at the helm.

Second Deckhand. The 26-year-old second deckhand, who died in the fire, had been working on the *Conception* for about a week when the accident occurred. It was her second voyage aboard the vessel. She did not hold, nor was she required to hold, a merchant mariner credential. Prior to joining the *Conception* crew, she had worked for a couple months as a galley hand on another Truth Aquatics vessel.

The second deckhand's duties were similar to the first deckhand. According to other crewmembers, she was being trained on the various duties of the position during the previous and accident voyages. She was also designated as the safety diver, requiring her to stand by with a wetsuit on while divers were in the water. As such, she held certifications for advanced open water diving.

First Galley hand. The 34-year-old first galley hand had been working on the *Conception* for about 3 weeks before the accident. He had no prior experience working on vessels; he did not hold, nor was he required to hold, a merchant mariner credential. The first galley hand had worked in the hospitality industry for about 11 years before being hired by Truth Aquatics. During an interview with law enforcement officials, he stated that he had made about five to six voyages on the *Conception*, the first two under the supervision of the first galley hand whom he eventually replaced.

The first galley hand's duties included purchasing food and stores for each voyage, developing the menu and preparing food, and supervising the second galley hand.

Second Galley hand. The 58-year-old second galley hand had worked on the *Conception* since October 2017. He did not hold, nor was he required to hold, a merchant mariner credential. He stated that, prior to being hired by Truth Aquatics, he had worked in the restaurant industry for about 30 years.

The duties of the second galley hand included food preparation, making coffee, washing dishes and silverware, and general cleaning in the galley and salon.

1.9.3 Toxicological Testing

Company drug and alcohol testing program. As required by regulation, Truth Aquatics had a workplace pre-employment and random drug and alcohol testing program. During annual inspections by the Coast Guard, inspectors were required to verify that the company's program was in place and being properly followed.

According to Truth Aquatics' *Employee Education Program for the Drug and Alcohol Free Workplace*, a document that was provided to employees when they were hired, employees were "prohibited from unlawful manufacture, distribution, dispensing, possession of, or use of a controlled substances without authority on Truth Aquatics, Inc.'s premises." Further, the document stated that "The presence of any detectable amount of any illegal drug in an employee while performing Truth Aquatics, Inc.'s business or while on Truth Aquatics, Inc.'s premises is prohibited." Surviving crewmembers told investigators that there was a strict no-alcohol/no-drugs policy for employees while on board the *Conception*, but passengers were permitted to bring aboard and consume alcohol.

Postaccident toxicological testing. Just after 0800 on the accident date, upon the arrival ashore at Channel Islands Harbor, the second captain, first deckhand, and the second galley hand were administered required postaccident breathalyzer tests for alcohol. The captain was tested

when he arrived at the harbor about 45 minutes later. All tests results were negative. The first galley hand was not tested prior to being transported to the hospital.

On the day after the accident, all surviving crewmembers underwent required postaccident urine drug testing.³¹ The first galley hand tested positive for marijuana metabolites. He told law enforcement officials that he had smoked marijuana a few days before the accident voyage but not during the voyage. The urine results for the captain, second captain, and first deckhand tested negative for drugs; the second galley hand tested negative dilute.³²

Toxicology testing was performed during the autopsy of the deceased second deckhand. Results were negative for alcohol and other tested-for drugs.

1.10 Waterway Information

Platts Harbor is a rounded inlet surrounded by cliffs and steep hillsides on the north side of Santa Cruz Island that provides a partially protected anchorage for small vessels. The harbor lies on the Pacific Ocean within the Santa Barbara Channel, a 20-mile-wide waterway formed by the California Coast and the Channel Islands, including Santa Cruz. Water depths in Platts Harbor range from 20 to 54 feet at mean lower low water, with a tidal range of about 5.5 feet on the morning of the accident.³³ The charted seabed type is rocky.

1.11 Meteorological Information

The accident occurred during nighttime hours, with civil twilight beginning at 0608 and sunrise at 0633. At 0310, a remote weather observation site about 4 miles southeast of the accident site on Santa Cruz Island recorded an outside air temperature of 64.6°F and a wind speed of 6.4 knots, with gusts up to 9.6 knots from the east. The nearest marine data buoy from the National Data Buoy Center (buoy number 46053), located about 13 miles north-northwest from the accident site, recorded a water temperature of 64°F. At the anchorage in Platts Harbor, the deckhand from the *Conception* recalled that from the skiff, “there was no swell and no current really that I noticed at all.” According to the second galley hand, “the wind was light.” According to the owner of the *Grape Escape*, there was “absolutely no wind” or fog.

1.12 Postaccident Actions

Shortly after the fire on the *Conception*, the Coast Guard issued an MSIB addressing passenger vessel compliance and operational readiness for small passenger vessels, MSIB 008-19. The MSIB recommended owners, operators, and masters of passenger vessels complete a review of the overall condition of the passenger accommodation spaces for unsafe practices and other

³¹ Urine drug testing is limited to identifying urinary metabolites of cocaine, codeine, morphine, heroin, phencyclidine (PCP), amphetamine, methamphetamine, methylenedioxymethamphetamine (MDMA), methylenedioxyamphetamine (MDA), methylenedioxyethylamphetamine (MDEA), tetrahydrocannabinol (THC), oxycodone, oxycodone, hydrocodone, and hydromorphone.

³² A *negative dilute* sample can occur when the donor consumes a large quantity of fluids before providing the urine specimen. The urine results for the second galley hand were labeled negative dilute; both creatinine and specific gravity were out of range. No follow-up urine testing under direct observation was performed.

³³ *Mean lower low water* is the average of the lower low water height of each tidal day observed over the National Tidal Datum Epoch.

hazardous arrangements, and “reduce potential fire hazards and consider limiting the unsupervised charging of lithium-ion batteries and extensive use of power strips and extension cords.”

The Coast Guard initiated a Concentrated Inspection Campaign for all Subchapter T-inspected vessels with overnight accommodation for passengers.³⁴ On October 2 and November 1, 2019, the Coast Guard inspected the Truth Aquatics vessel *Vision* while it was not in operation and noted a total of 40 deficiencies. By comparison, during the previous annual inspection, carried out on April 2019, there were no deficiencies noted by the attending Coast Guard marine inspector. The concentrated inspection was conducted independent of the required regulatory inspections for certification and focused on firefighting, fire protection, means of escape systems, and crew proficiency/knowledge regarding the elements of firefighting, fire protection, and means of escape that rely on human intervention to successfully operate.

Among the deficiencies documented aboard *Vision* was a requirement to provide a means of escape from the shower room that leads to an area that does not contain any source of fire (such as a galley stove). In the bunkroom, deficiencies were issued for an inoperable public address system speaker and for having a trash container without metal covering. The Coast Guard noted that the double bunks did not allow for free and unobstructed escape for the inside occupant as per the regulations. This bunk arrangement deficiency had never been cited during the previous 40-year history of the vessel. The Coast Guard also issued a “prior to carriage of passengers” order for the grease extraction hood, which was missing a heat detector (removed and taken as evidence by federal law enforcement during a search warrant served at the Truth Aquatics office and the *Truth* and *Vision* September 8–10, 2019), had a build-up of grease, and was missing a maintenance plan.

After the fire on the *Conception*, Truth Aquatics voluntarily began modifications to the *Vision* and the *Truth* to improve safety aboard its two remaining vessels and address the deficiencies found during the Coast Guard’s inspections. The owner stated that, on each vessel, an integrated fire-detection system with manual call points was being installed, as well as an electronics-charging cabinet. The cabinet was equipped with self-closing doors and a fire-suppression system that vented to the exterior and was integrated with the fire-detection system. A relay for the fire detection system was designed to shut down all ventilation if smoke is sensed in any compartment on board each vessel. Additionally, the owner stated that the company was in the process of implementing a logging requirement for roving patrols. Fire escape ladders were procured for both wheelhouse wing stations, as well as Lipo-Safe bags for use while charging handheld VHF radios.³⁵ Further, to improve the bunkroom egress on the *Vision*, watertight hatches leading from the bunkroom to the exterior walkways were installed on both the port and starboard side of the vessel, with ladders to assist with egress through the hatch ([figure 32](#)).

³⁴ According to Coast Guard data, 383 vessels with overnight accommodations were inspected during the campaign, including 357 vessels under Subchapter T and 26 vessels under Subchapter K.

³⁵ A *Lipo-Safe bag* is used for the charging and stowage of batteries. The bag has an inner lining made from a woven fire-retardant fiberglass material, which helps contain and reduce the risk of fires spreading outside the bag.



Figure 32. Modifications made to the *Vision* after the accident on the *Conception*. Left: Ladders at the forward end on each side of the bunkroom lead directly to the weather deck. Right: Flush-mounted watertight hatches were installed in the deck, outboard of the galley. (Source: Truth Aquatics)

Because the Coast Guard considered the *Vision*'s new egress to be a major modification, the new and existing emergency escapes were subject to New T regulations, even though the *Vision* was considered an existing vessel. New T regulations are more specific regarding emergency exit pathways, and as such, the owner of the *Vision* was required to submit the plans to the Coast Guard for approval. At the time of this report, the owner's fire-detection system plans are also under review by the Coast Guard.

1.13 Similar Small Passenger Vessel Accidents and Related NTSB Safety Recommendations Previously Issued

1.13.1 Passenger Ferry *Andrew J. Barberi* – 2003

On October 15, 2003, the ferry *Andrew J. Barberi* struck a maintenance pier at the Staten Island Ferry terminal in Staten Island, New York. Fifteen crewmembers and an estimated fifteen-hundred passengers were on board. Eleven passengers died as a result of the accident, and seventy were injured. The NTSB determined that the probable cause of the accident was in part due to the failure of the New York City Department of Transportation to implement and oversee safe, effective operating procedures for its ferries. As a result of the investigation, the NTSB issued Safety Recommendation M-05-6 to the Coast Guard to “seek legislative authority to require all U.S.-flag ferry operators to implement [safety management systems] SMS, and once obtained, require all U.S.-flag ferry operators to do so.”

The Coast Guard Authorization Act of 2010 authorized the Coast Guard to require the implementation of SMS on domestic passenger vessels, including domestic ferries, which satisfied the first part of Safety Recommendation M-05-6 (seek legislative authority to require all US-flag ferry operators to implement SMS).

1.13.2 Passenger Ferry *Andrew J. Barberi* – 2010

On May 8, 2010, the *Andrew J. Barberi* was involved in a second accident when it struck a terminal structure at the St. George terminal in Staten Island, New York, after a loss of propulsion control. Eighteen crewmembers, two New York City police officers, two concessionaires, and two-hundred and forty-four passengers were on board. As a result of the accident, three passengers sustained serious injuries; forty-seven passengers, crew, and others reported minor injuries. The NTSB determined that the probable cause of this accident was a solenoid failure, which caused a loss of propulsion control of one of the vessel's two cycloidal propellers. In its report, the NTSB noted that the New York City Department of Transportation had voluntarily implemented an SMS after the 2003 accident involving the vessel, which was evident in the response to the 2010 accident when personnel carried out their designated emergency procedures in a timely and effective manner. The NTSB expressed concern, however, that SMSs were still not required on US passenger vessels in domestic service. As a result, the NTSB superseded Safety Recommendation M-05-6 with Safety Recommendation M-12-3, which recommended that the Coast Guard require all operators of US-flag passenger vessels to implement SMSs, taking into account the characteristics, methods of operation, and nature of service of these vessels, and, with respect to ferries, the sizes of the ferry systems within which the vessels operate.

1.13.3 *Seastreak Wall Street* – 2013

The *Seastreak Wall Street*, a high-speed passenger ferry serving commuters traveling between New Jersey and New York City, struck a Manhattan pier at about 12 knots on January 9, 2013. Of the 331 people on board, 79 passengers and 1 crewmember were injured, 4 of them seriously. The NTSB determined that the probable cause of the accident was the captain's loss of vessel control because he was unaware that the propulsion system was in backup mode. In addition, his usual method of transferring control from one bridge station to another during the approach to the pier did not allow sufficient time and distance to react to the loss of vessel control. Contributing to the accident, in part, was the operator's ineffective oversight of vessel operations. In the report, the NTSB stated that it "continues to highlight the need for unambiguous, detailed operating procedures and believes they are prerequisite to managing a safe transportation system" and recommended that the operator implement an SMS. The report noted that regulations had yet to be implemented requiring SMSs for small passenger vessels, and thus the NTSB classified Safety Recommendation M-12-3 "Open-Unacceptable Response."

1.13.4 *Island Lady* – 2018

On January 14, 2018, a fire broke out in an unmanned space on the small passenger vessel *Island Lady* near Port Richey, Florida, during a scheduled transit to a casino boat located about 9 miles offshore in the Gulf of Mexico. Fifty-three people were on board the *Island Lady*. After the captain beached the vessel, all crewmembers, employees, and passengers evacuated it by entering the water and wading/crawling ashore. Fifteen people were injured; one passenger died in the hospital several hours after the fire. The NTSB determined that the probable cause of the accident was the operator's ineffective preventive maintenance program and insufficient guidance regarding the response to engine high-temperature conditions. In the report, the NTSB found that a requirement for an SMS would likely have ensured greater adherence to completing crew training drills, appropriate responses to emergencies such as alarms and fires, and failsafe record-keeping of training and maintenance-related documents. Therefore, the NTSB reiterated Safety Recommendation M-12-3.

In the report on the *Island Lady* accident, the NTSB concluded that had the vessel been outfitted with fire detectors in the lazarette, the fire and its location would have been identified earlier, proving the opportunity for a swifter response. The NTSB issued Safety Recommendation M-18-13 to the Coast Guard to “require fire detection systems in unmanned spaces with machinery or other potential heat sources on board small passenger vessels.” The Coast Guard responded in October 2020, and the recommendation is currently classified “Open—Response Received.”

1.13.5 *Vision* – 2018

A small fire involving the charging of a lithium-ion battery took place on board the Truth Aquatics small passenger vessel *Vision* about a year before the fire aboard the *Conception*. On October 8, 2018, between 0415 and 0430 in the morning, a passenger, who was awake and in the galley, heard a “hissing” noise and then a loud “bang” that came from the bookshelf located at the aft starboard side of the salon (the *Conception* did not have a bookshelf in the same area). Another passenger, who was returning to the bunkroom after using the restroom on the aft deck, also heard the noise, which drew his attention to a fire on the bookshelf. He stated that the fire looked like a “torch” flame, and a battery charger (which was charging two lithium-ion batteries) was emitting smoke. The passenger in the galley grabbed a dry chemical extinguisher from the galley, and both passengers went to the battery charger. The passenger without the fire extinguisher unplugged the charger, grabbed the unburnt end of the charger, brought it out to the main deck, and threw it in to the rinse bin located under the stairs to the sun deck. The passenger with the fire extinguisher stated he discharged one “shot” on the bookshelf after the battery charger had been removed to extinguish the smoldering paper books on the shelf. He then grabbed a sponge and wetted the bookshelf and items on it to prevent reignition.



Figure 33. Photograph taken of the battery charger that caught fire on the *Vision* (with the batteries removed).

Afterward, the passenger went to the wheelhouse and informed the captain, who in turn examined the batteries and charger in the rinse bin. The batteries and charger were removed from the rinse bin and thrown overboard. One of the passengers interviewed stated there was soot residue and scorch marks on the books and the shelf.

The two batteries that caught fire were for an underwater diving light, and, according to the owner, the batteries had been removed from the light and were connected to a separate charger and plugged into a power strip on the bookshelf. The lithium-ion batteries were each 3.7 volts and capable of 5,000 milliamp hours.

According to the captain on the *Vision* at the time, who was filling in as a relief captain, he photographed the charger and sent the photo to another captain in the Truth Aquatics fleet. Upon returning from the trip, he informed the owner of Truth Aquatics as well as the captain that took the *Vision* on its next trip.

The owner of Truth Aquatics stated he was only made aware of the small fire on the *Vision* after the accident on the *Conception*. The owner noted that at the end of each trip, each captain was required to complete a “Trip Payment Report,” which required multiple handwritten entries

related to the voyage conducted, including the number of people on board, the amount of fuel used, and the number of engine running hours. At the bottom of the form, there was a “special comments about the trip section” where the captain on duty was required to enter any notable incidents that occurred during the trip, including “any accident, bad weather, notable rescues or incidents.” Investigators reviewed the completed form for the October 7–10 trip for the *Vision* and found no entries made in this section.

There was no report to the Coast Guard of this incident, nor was there any requirement to do so, since the size of the fire did not meet the monetary damage threshold stated on the marine casualty reporting form (CG-2692), nor did it require treatment of injury beyond first aid or loss of life.

1.13.6 Red Sea Aggressor – 2019

On November 1, 2019, two months after the *Conception* accident, another dive vessel with overnight accommodations caught fire and sank. Just after midnight, the Egyptian-flagged, 120-foot, 247-gross-ton passenger, fiberglass-over-wood vessel *Red Sea Aggressor* (formerly named the *Suzanna I*) caught fire while at a mooring off the coast of Port Ghalib, Egypt, with 19 passengers and a reported 12 crewmembers on board. All on board, except for one passenger, were able to abandon the *Red Sea Aggressor*. The passengers in the water were picked up by the crew in the vessel’s dinghy and brought to a dive vessel moored nearby. The passenger who did not escape, a female adult US citizen, was last seen in the lower deck accommodation space and was never found. She is presumed dead. The *Red Sea Aggressor* remained on fire until it sank.

Passengers told investigators that they understood that there was a vessel-wide interconnected smoke detector system. Although the *Red Sea Aggressor* had fire detectors in the salon area—where the fire was suspected to have started—and in each of the staterooms, the passengers and crew sleeping below did not hear any alarms.

Surviving passengers told investigators that they were informed there was a crewmember on watch during sleeping hours; however, none of the crew and passengers sleeping below deck were alerted to the fire by a crewmember. Surviving passengers stated they were either awakened by the smell of smoke or by other passengers.

Similar to the *Conception* fire, the primary egress stairs to the main salon were blocked by smoke and fire. The below-deck passengers and crew escaped via an escape hatch that exited to a crew berthing area and up a ladder that led to the deck above, into a space separate from the primary stairway egress route. The passenger that opened the escape hatch, which was in his stateroom, recalled it was blocked on the other side by a mattress on which a crewmember was sleeping. The crewmember was awakened, and the mattress removed, allowing them to escape.

Because US citizens were on board the vessel, and the fatality was a US citizen, the Coast Guard conducted an investigation related to the circumstances of the fire and subsequent sinking of the vessel by conducting interviews of witnesses and the surviving passengers. The NTSB was invited by the Coast Guard Office of Investigations and Casualty Analysis to participate in the investigation into the circumstances into the fire and subsequent sinking of the vessel. NTSB investigators were unable to interview the crew or management at Aggressor Adventures, the US-based company operating the *Red Sea Aggressor*, since they refused to be interviewed by the Coast Guard.

2 Analysis

2.1 General

The analysis first identifies factors that can be eliminated as causal to the fire aboard the *Conception*. The following issues are discussed next:

- Origins and potential sources of the fire
- Cause of death
- Fire detection
- Roving patrol
- Means of escape
- Search-and-rescue efforts
- Oversight

2.2 Exclusions

2.2.1 Weather

At the time the fire broke out on the *Conception*, weather and sea conditions were calm and did not contribute to the fire or hamper the crew's attempted rescue efforts of the passengers and crewmember in the bunkroom. While conditions of reduced visibility were experienced by vessels responding to the accident, the weather and sea conditions did not impact their efforts to respond to the accident and fight the fire and did not have an effect on the survivability of those on board. The NTSB concludes that weather and sea conditions were not factors in the accident.

2.2.2 Alcohol and Other Drugs

Surviving crewmembers stated that, in accordance with company policy, they had not consumed any alcohol during the accident voyage, nor had they seen any other crewmember consume alcohol. Following the accident, the captain, second captain, first deckhand, and second galley hand were tested for the presence of alcohol, and all results were negative. The surviving crewmembers were also tested for the presence of drugs, and results for the captain, second captain, and first deckhand were negative. The results for the second galley hand were negative dilute. The results of toxicology testing in association with the coroner's examination of the second deckhand were also negative for alcohol and drugs. The first galley hand was not tested for alcohol because he was taken immediately to the hospital and treated for his injury upon arrival ashore. The first galley hand tested positive for marijuana metabolites in his urine. Metabolites for marijuana can remain in the body for up to 30 days, so the galley hand's statement that he did not consume the drug while on the *Conception* is plausible. The NTSB concludes that the use of alcohol or other tested-for drugs by the *Conception* deck crew was not a factor in the accident.

2.3 Origins and Potential Sources of the Fire

The fire aboard the *Conception* burned out of control with no intervention for about 1 hour and 41 minutes from the time of the captain's initial distress call until firefighters arrived and began firefighting efforts. Due to the combustible nature of the vessel's fiberglass-over-plywood

construction, very little material above the main deck remained after the fire had been extinguished by the emergency responders. Examination of the recovered wreckage and debris did not yield any physical evidence relevant to the origin and cause of the fire.

The surviving *Conception* crewmembers that investigators interviewed provided a snapshot of the state of the fire when it was first discovered. Their descriptions of the fire provide the basis for the analysis of the probable origin area of the fire. In addition to the crew interviews, an examination of a similar vessel in the Truth Aquatics fleet, the *Vision*, was performed to identify possible types of ignition sources available in the likely origin areas. Statements from previous passengers and crew on the *Conception* were also considered when evaluating the likely ignition sources for the fire.

2.3.1 Area of Origin

None of the crewmembers interviewed by NTSB investigators reported any open flame or heat upon waking up from their bunks on the upper deck. The second galley hand did not report any fire on the open sun deck located aft of the accommodation and wheelhouse.

During interviews, none of the crewmembers reported that they saw flames or felt heat coming from the anchor room located at the forward bow area below the main deck. Further, examination of the electrically powered winch motor and ropes recovered with the wreckage showed no signs of significant heat damage in that space.

All galley appliances on board the *Conception* were electrically powered. The crew reported that the vessel's refrigerators and freezers were the only equipment operating on the morning of the fire. As a precaution, and to prevent any accidental activation of an unattended burner, the vessel's second galley hand opened the breakers for the flat-top griddle and the cooktop's two burners the night before the accident. The second galley hand said that the only galley equipment running at the time of the accident were the refrigerators.

Once the fire was discovered, crewmembers reported that they attempted to access the center galley window from the bow. The crewmembers saw smoke through the window and did not feel significant heat, allowing them to attempt to pry it open. Considering that all galley equipment was reported to be either de-energized or in good condition, the evidence indicates that the fire did not originate in the main deck galley at the forward section of the salon compartment.

The fire also did not likely originate in the below-deck shower room or bunkroom. No fire or high heat were reported in the forward part of the galley, located above the shower room, and there was no heat, smoke, or flame sighted by a crewmember in the anchor room, which was adjacent to and forward of the shower room. With 33 passengers in the bunkroom and smoke detectors present, it is unlikely that an accidental fire could grow undetected in the bunkroom to the point where it would trap the occupants and preclude escape.

While abandoning the vessel after the galley/salon and wheelhouse had been engulfed in flames, two surviving crewmembers opened the engine room hatch and described seeing the space filled with smoke. But neither described a presence of intense heat associated with a fire, nor did they recall hearing the alarm produced by the release of carbon dioxide from the heat-activated fixed fire-extinguishing system. Since the *Conception* was anchored with both main propulsion engines shut down, the smoke in the engine room was likely from the established fire, which entered the engine room via the main deck ventilation ducting.

At night, it was normal procedure to operate the fan that was in the bulkhead between the engine room to the lazarette to help dry wet suits hanging in the lazarette. The fan likely would have drawn smoke in through the main deck ventilation ducting and filled the engine room and lazarette. Given that the lazarette was aft of the engine room, and the entrance was adjacent to where the two crewmembers had re-boarded the vessel, accessed the skiff, and passed en route to the engine room without feeling any heat, it is not likely there was any fire in the lazarette.

The diesel generator had a history of overheating while running all three air compressors and operating the flat cooktop in the galley. However, at the time of the fire, none of the air compressors were operating, nor was the flat cooktop. Additionally, surviving crewmembers reported that electrical power was being supplied by the generator during the evacuation of the vessel, after fire had engulfed the salon. Electric lights in the engine room and lazarette were seen to be illuminated during the evacuation of the vessel, and the aft swim platform hydraulic-electric winch was used by the crew to lower the skiff into the water and escape the burning vessel, indicating that the generator was functioning at the time of abandonment.

The aft portion of the salon compartment, and in particular the starboard side, was consistently identified in the crew interviews as having the most intense fire at the time they encountered it. When observed from the upper deck through the door to the crew berthing area, the crewmembers described an orange glow near the stairs at the aft starboard end of the sun deck. Approaching the stairs and looking down, the second galley hand described flames at the base of the stairs and the starboard toilet, preventing him from using the stairs to access the main deck. The crewmembers also described smoke coming up the sides of the sun deck on both the port and starboard sides. Crewmembers used the port side of the sun deck and the portside wing station of the wheelhouse to make their way down to the main deck after their initial assessment of the conditions.

The crew described the fire as filling and effectively blocking the open doors to the aft portion of the salon and extending outward to where the restrooms were located. Smoke and some intermittent flames were also described as coming out the aftmost windows of the salon on the port side of the vessel. The second galley hand, who was the first crewmember to arrive on the main deck, was able to drop down from the port side of the sun deck. He was able to walk down the port side of the vessel to the open doors to the salon, where he witnessed the entire area engulfed in flames, including the escape hatch, before walking back up the port side to the bow. The other crewmembers dropping down to the main deck after him did not feel that they could walk down the port side of the vessel to access the stern due to the smoke and some flames that were exiting the aftmost portside windows of the salon.

At the exterior aft of the salon, there was a large polyethylene trash can underneath the stairs to the upper deck. Polyethylene trash cans are highly combustible and cannot contain a fire originating from within. However, fire tends to spread vertically at a much greater rate than it does horizontally. If the fire had started on the exterior of the salon in the area of the stairs to the upper deck, it would be reasonable to expect that the fire would have spread vertically, igniting the stairs above and spreading to the upper deck before it spread horizontally and into the salon compartment. The descriptions given of the fire indicate more fire involvement internal to the salon and around the port and starboard restrooms of the entranceway to the salon than external and spreading up to the upper deck. The NTSB concludes that the origin of the fire on the *Conception* was likely inside the aft portion of the salon.

2.3.2 Ignition

Potential Sources. In the interior of the aft portion of the salon, the potential sources of ignition available included the vessel's electrical system and the electronic devices and batteries being charged at the aftmost tables and aft bulkhead area. On the aft exterior of the salon, the potential ignition sources would likely be limited to improperly discarded smoking materials in the trash can.

An energized electrical system has the potential to become a source of ignition when elements of the system age, are improperly installed, or are accidentally damaged. Crew interviews revealed that, on occasion, electrical work, such as the replacement of lighting electrical fixtures in the salon, was completed by crewmembers, who were not licensed electricians. Although examination of the *Conception's* electrical system was not possible, the examination of the *Vision* and the similarity of the two vessels would suggest similar electrical installations and condition. On October 2, 2019, a Coast Guard inspection found 19 electrical system deficiencies throughout the *Vision*. Some of the deficiencies cited were a result of work being done at the time. Deficiencies in the salon and galley area included corrosion, improper connectors, and signs of overload on a power strip. Deficiencies of this type can lead to electrical system malfunctions capable of initiating a fire.

Since the salon compartment was a critical element in the egress pathway from the passenger bunkroom, prudent fire safety planning would suggest that risky activities (unattended charging of batteries) and materials, such as the plastic chairs and polyethylene trash cans, that could contribute to a fire should have been minimized in this area. This was not the case on the *Conception*. Crew statements, as well as statements from previous passengers, indicated that the overnight, unattended charging of a large number of batteries was a normal practice in the salon compartment and was a risk that had not been considered. Each device and battery represented a separate potential source of ignition. The passengers on the *Conception* were recreational divers, so in addition to common types of electronic items, such as phones, tablets, digital cameras, and laptops, divers also used underwater cameras, flashes, strobes, and flashlights.

Batteries (in particular, lithium-ion batteries) have a known and documented history of initiating accidental fires. In the past, the Consumer Product Safety Commission has issued numerous product safety recalls due to fires caused by electronic devices with defective batteries and chargers. The NTSB has investigated accidents in which battery failures led to fires, and, based on the history of incidents involving fires, the Federal Aviation Administration enforces regulations on the carriage of lithium-ion batteries aboard passenger aircraft.³⁶ About a year prior to the fire on board the *Conception*, a small fire involving a charging lithium-ion battery took place on board the similar vessel *Vision*; a passenger was able to extinguish the fire by unplugging the charger and throwing it in a rinse bin. However, unlike in the incident on board the *Vision*, the fire aboard the *Conception* grew, and the vessel burned for almost four hours, thus destroying much of the materials in the salon and aft deck area. Further, based on past accidents that the NTSB has investigated, conclusive causal physical evidence identifying a thermal runaway of a lithium-ion

³⁶ Recent NTSB investigations involving battery fires include *Lithium-Ion Battery Truck Fire Following Aerial Transport, Brampton, Ontario, Canada, June 3, 2016* ([HZB-20/01](#)) and *Auxiliary Power Unit Battery Fire Japan Airlines Boeing 787-8, JA829J, Boston, Massachusetts, January 7, 2013* ([AIR-14/01](#)). These reports and other information regarding investigations involving battery fires are available at www.nts.gov.

battery is difficult to differentiate from a lithium-ion battery thermal runaway caused by exposure to fire.

At the exterior of the aft portion of the salon (in the area where the stairs lead to the upper deck), the only potential sources of ignition would include transient types, such as discarded smoking materials. Based on the examination of the *Vision* and the statements from previous passengers, there was no evidence of electrical systems or electronic devices being charged in this area. There was, however, one large polyethylene trash can located aft of the salon underneath the stairs to the upper deck where one could potentially discard smoking materials. Old T regulations did not allow for the use of these trash cans in the passenger bunkroom but did not preclude their use in any other area of the vessel. New T regulations do not allow the use of these combustible trash cans in any areas of the vessel but do not retroactively apply to vessels built under the Old T regulations unless they are replaced. As stated earlier, polyethylene trash cans are highly combustible, making them susceptible to accidental fires that could be caused by the improper disposal of smoking materials or other unforeseen sources of ignition. The NTSB concludes that although a definitive ignition source cannot be determined, the most likely ignition sources include the electrical distribution system of the vessel, unattended batteries being charged, improperly discarded smoking materials, or another undetermined ignition source.

Time of Ignition. Fires not involving accelerants (such as fuel) typically go through an incipient stage following the ignition and then transition into a growth stage. The rate of the growth stage is highly dependent on the type of materials burning and the geometry of the compartment in which the fire is taking place. Fires inside compartments such as the *Conception's* salon, which had a low ceiling (about 7.5 feet), tend to have high growth rates due to the heat from the fire and products of combustion accumulating at the ceiling and thermally radiating down to the unburned materials. This radiative heating causes the materials to begin to thermally break down and emit flammable vapors. Once this happens, the compartment fire can enter a stage called flashover during which all the combustible materials start to become involved, and the compartment becomes filled with flames. At this point, the compartment is deemed untenable for human survival.

Based on the crew interviews, the fire likely reached the flashover stage around the time or shortly after it was discovered. The crew interviews indicated that a window of approximately 30 minutes passed between the time the salon compartment was last visited to when the fire was discovered. Sometime within that 30-minute window, an incipient fire became established and transitioned into a fast-growing fire, followed by flashover. The construction materials of the vessel (fiberglass over wood) were not fire-resistant and are, in fact, known to burn quite freely. Additionally, the interior furnishings such as the wooden tables, plastic chairs, polyethylene trash cans, seat cushions, and FRP laminates would have added to the fast-growing fire. The compartment configuration would compound the ease of combustibility by trapping the heat and preheating the materials not yet involved. It is not unusual under these circumstances for a fire to reach the flashover point in a short timeframe. The unknown in this accident is the incipient stage of the fire, which depends on the ignition source, the location of the ignition, and the first materials to become involved. Therefore, the NTSB concludes that the exact timing of the ignition cannot be determined.

2.4 Cause of Death

NTSB investigators reviewed reports completed by the Santa Barbara Coroner's Office for all 34 decedents. Autopsies were not completed due to severe thermal injuries, obvious trauma, and the circumstances of the accident. All deaths were attributed to smoke inhalation.

On the similar Truth Aquatics vessel *Vision*, NTSB investigators examined the bunkroom ventilation equipment, which consisted of an air conditioning unit, an electric supply fan, and two electric exhaust fans. The combined air flow capacities of the *Vision's* two exhaust fans exceeded the capacity of the single supply fan, and air was likely drawn into the bunkroom from the open stairs leading to the galley and salon area.

The *Vision's* bunkroom ventilation equipment was similar to the type and size of equipment on board the *Conception*. At the time of the fire, the larger combined capacity of the operating bunkroom exhaust fans could have drawn smoke and noxious gases from above in the salon down into the bunkroom via the open stairwell. The air conditioning unit circulation fan, which was operating at the time of the accident and took suction from a grille diffuser directly at the bottom of the stairs and discharged to vents located in each bunk and to the passageways between the bunks, would have further distributed the smoke and gas. The bunkroom ventilation system likely continued to operate during the initial stages of fire aboard the *Conception*, although the exact timing when the air conditioning unit and ventilation fans ceased operating could not be determined. Given the ventilation imbalance and that the one open exit led to the space with the fire, it is likely the bunkroom filled with smoke.

Coroner reports and diver video also documented that 13 deceased passengers were wearing footwear, and the second deckhand had sandals on both of her feet, indicating that some of the passengers and the second deckhand were awake and attempting to escape prior to being overcome by smoke. In one case, the victim was wearing a sandal on one foot and a hiking boot on another, indicating that the victim was likely in a rush. Passengers also appeared to have prepared to escape the vessel, since two victims had cell phones, one had a flashlight, another had a backpack, and two were wearing jackets. Silhouette areas of protection were found on unburned, sooted wood in the forward bunkroom near the stairs to the galley and salon, indicating that some of the passengers were not in their bunks and were laying against those sections prior to the sinking of the *Conception*. The passengers who were awake would have likely awakened the other passengers before they attempted to escape the bunkroom. Therefore, the NTSB concludes that most of the victims were awake but could not escape the bunkroom before all were overcome by smoke inhalation.

2.5 Fire Detection

The *Conception* was equipped with two modular smoke detectors in the bunkroom—one mounted in the overhead of each aisle (port and starboard). Coast Guard regulations required no additional smoke detectors aboard the *Conception*, and therefore the salon and crew quarters were not equipped with them. Truth Aquatics' owner told investigators the smoke detectors in the bunkroom had hard-wired power supplies with a battery backup. Interviews with crewmembers and the owner of Truth Aquatics indicated that the bunkroom smoke detectors were likely operational. Contractors working on the air conditioning had inadvertently activated them about one month prior to the accident. The captain of the *Conception* unplugged the detectors while the contractor was soldering but plugged them back in and replaced the batteries and tested the

detectors after the work was finished. Since the captain of the *Conception* was not able to be interviewed, investigators were unable to determine any specifics of the detectors being placed back in service, when he last tested them, or any routine tests and inspections the captain had for the detectors. Aboard the *Vision*, however, investigators found the smoke detectors' hard-wired power supply disconnected, although the battery-powered detectors were functional and met the regulations.

Smoke detectors sense products of combustion, which are hot and rise due to buoyancy, and activate an alarm. Smoke detectors mounted to ceilings therefore will encounter the products of combustion as early as possible. The smoke detectors in the passenger bunkroom would have provided early warning of a fire originating in the bunkroom only. When a fire in the salon (the compartment above the bunkroom) began to produce combustion products, those products would have risen to the ceiling and spread out along the length of the ceiling until they reached the bulkheads, creating a smoke layer at the ceiling that thickened and began to fill the compartment from the top down. The buoyancy of the smoke layer would have made it difficult for sufficient amounts of combustion products to migrate down to deck level, and even more difficult to migrate further down into the compartment below. A fire in the salon therefore would not have activated the smoke detectors in the bunkroom in a timely manner, allowing the fire time to grow. The NTSB concludes that the fire in the salon on the main deck would have been well developed before the smoke activated the smoke detectors in the bunkroom.

In accordance with New T (all vessels) regulations applicable to the *Conception*, the only compartment that was required to be fitted with smoke detectors was the passenger bunkroom, since it was the vessel's only overnight accommodation space. More robust fire-detection systems are required for larger US-flagged passenger vessels, such as those inspected under 46 *CFR* Subchapter K. On Subchapter K vessels, accommodation, control, and service spaces are required to have a "smoke actuated fire detection system" and "a manual alarm system." New T regulations (all vessels), in contrast, only require a household-type smoke detector.

A properly functioning fire-detection system with appropriately located smoke detectors is an effective means of early warning and detection of fire. Successful escape from fires is contingent on early warning, especially when occupants are asleep. The *Conception* had no smoke detectors anywhere in the main deck salon area where crewmembers reported seeing the fire. The nearest heat detector was well forward in the galley, a deck above the bunkroom, and was not intended to be utilized as a smoke detector for the entire salon. The NTSB concludes that although the arrangement of detectors aboard the *Conception* met regulatory requirements, the lack of smoke detectors in the salon delayed detection and allowed for the growth of the fire, precluded firefighting and evacuation efforts, and directly led to the high number of fatalities in the accident. The NTSB therefore recommends that the Coast Guard revise 46 *CFR* Subchapter T to require that newly constructed vessels with overnight accommodations have smoke detectors in all accommodation spaces. The NTSB likewise recommends that the Coast Guard revise 46 *CFR* Subchapter T to require that all vessels with overnight accommodations currently in service, including those constructed prior to 1996, have smoke detectors in all accommodation spaces.

Regulations require fire detection in engine rooms on most Subchapter T vessels, including the *Conception*, which had heat detection and a fixed fire-suppression system in its engine room. In January 2018, a fire that started in the lazarette—a space that was not required to have fire detection—on board the *Island Lady* went undetected and grew out of control. After the fire was established and spread, it eventually engulfed the vessel. In its investigation of the *Island Lady* accident, the NTSB concluded that had there been a smoke detector in the lazarette, the fire and

its location would have been identified earlier. The NTSB recommended that the Coast Guard require fire detection systems in unmanned spaces with machinery or other potential heat sources on board small passenger vessels.

The smoke detectors aboard the *Conception* only sounded locally, meaning that once a detector was activated, it sounded only in the space it occupied (in this case, the bunkroom). None of the surviving crew heard the vessel's detectors sounding during the fire, since the fire likely originated in the salon and not the bunkroom, where the smoke detectors were located.

An interconnected fire detection and alarm system would sound alarms in all spaces when one alarm is activated; the system would incorporate all required smoke and fire detectors fitted on board the vessel, including those in the engine room, other machinery spaces, or the lazarette. In this accident, an interconnected system with smoke detectors in all accommodation spaces would have sounded throughout the vessel in the salon, bunkroom, and upper deck, alerting crew and passengers and giving the crew more time to fight the fire and assist the passengers below. Passengers sleeping in the bunkroom would have been awakened by the alarms going off throughout the vessel, including in the bunkroom, giving them a better chance to escape.

The circumstances of this accident make clear that interconnected smoke detectors in all accommodation spaces would have given early warning of the fire to the passengers and crew and likely would have allowed time for the crew to fight the fire and assist passengers in evacuating the bunkroom. Currently, Subchapter K passenger vessels with overnight accommodations must have smoke detectors in accommodation spaces, but detectors are not required to be interconnected. Subchapter K vessels are typically larger than Subchapter T vessels, with more accommodation spaces and distance between those spaces. Additionally, Subchapter K vessels are allowed to carry more than 49 passengers overnight (or more than 150 passengers during the day). Therefore, interconnecting detectors on both Subchapter K and Subchapter T vessels is critical, since passengers and crew are subject to the risk of an undetected fire. The NTSB concludes that interconnected smoke detectors in all accommodation spaces on Subchapter T and Subchapter K vessels would increase the likelihood that fires will be detected early enough to allow for successful firefighting and the evacuation of passengers and crew. The NTSB therefore recommends that the Coast Guard revise 46 *CFR* Subchapter T and Subchapter K to require all vessels with overnight accommodations, including vessels constructed prior to 1996, have interconnected smoke and fire detectors such that when one detector alarms, the remaining detectors also alarm. (The system installed on Truth Aquatics' remaining vessels after the *Conception* fire exceeds the minimum requirements recommended here.)

The NTSB believes that it is imperative that operators of similar small passenger vessels learn about the circumstances of this accident and act without waiting for the Coast Guard to require action to install interconnected smoke detectors in all accommodation spaces to provide passengers and crew with early warning of fires. Therefore, the NTSB recommends to the Passenger Vessel Association, Sportfishing Association of California, and National Association of Charterboat Operators that, until the Coast Guard requires all passenger vessels with overnight accommodations, including vessels constructed prior to 1996, to have smoke detectors in all accommodation spaces, share the circumstances of the *Conception* accident with their members and encourage members to voluntarily install interconnected smoke and fire detectors in all accommodation spaces such that when one detector alarms, the remaining detectors also alarm.

2.6 Roving Patrol

The requirement to keep a watch at night while passengers are embarked on a vessel has been codified in US law for nearly 150 years. The law came into effect when vessels were primarily constructed of wood and the advent of steam power had greatly increased the threat of fire. The threat of fire has been reduced by modern engineering, fire detection, and fire extinguishing equipment, but the law has remained largely unchanged since it was originally enacted. While the probability of a fire is less, the consequences of a fire, particularly on a wood vessel carrying passengers, has warranted the continuation of the legal requirement for a watch at night.

In the event that a space is not equipped with a smoke detector, or if a smoke detector fails to activate, the only means of detecting a fire aboard the vessel is limited to discovery by a crewmember or a passenger. The law (46 USC Section 8102) requires “a suitable number of watchmen in the vicinity of cabins or staterooms and on each deck to guard against and give alarm in case of fire or other danger.” For small passenger vessels subject to Subchapter T regulations, this requirement has been interpreted by the Coast Guard to be a suitable number of watchmen who “patrol throughout the vessel during the nighttime, whether or not the vessel is underway, to guard against, and give alarm in case of, a fire, man overboard, or other dangerous situation.” This interpretation is based partly on the size of vessels subject to Subchapter T allowing a single watchman to rapidly patrol the vessel on a periodic basis.³⁷ On the *Conception* (and all other Subchapter T vessels visited by the NTSB during this investigation) the requirement for watchmen was included in the vessel’s COI, which stated “a member of the vessel’s crew shall be designated by the master as a roving patrol at all times, whether or not the vessel is underway, when the passenger’s bunks are occupied.”

According to surviving crewmembers, all members of the crew had gone to sleep the night before the fire, after the *Conception* had anchored in Platts Harbor. No roving patrol was set. When the second galley hand awoke, the fire was well developed and beyond the capability of the crew to extinguish it. The crew was not able to warn passengers or aid in their escape. Had a crewmember been awake and actively patrolling the *Conception* on the morning of the fire, it is likely that they would have discovered the fire at an early stage, allowing time to fight the fire and give warning to the passengers and crew to evacuate. The NTSB concludes that the absence of the required roving patrol on the *Conception* delayed detection and allowed for the growth of the fire, precluded firefighting and evacuation efforts, and directly led to the high number of fatalities in the accident.

The purpose of the Coast Guard inspections is to ensure that vessels are complying with applicable laws, regulations, and the terms of the vessel’s COI. The *Conception* was inspected as required by New T regulations (all vessels), and in the 5 years before the accident, inspectors found only minor discrepancies. Only one “prior to carriage of passengers” order was issued during that time, and it was cleared within a day. The owner of Truth Aquatics believed that the company’s fleet of three vessels was in compliance with the applicable regulations, based on satisfactory completion of the required Coast Guard inspections and examinations.

Prior to the accident, the *Conception* and other Truth Aquatics vessels were regularly operating in contravention of the regulations and the vessel’s COI, which required a roving patrol at night and while passengers were in their bunks. Truth Aquatics encouraged passengers to board

³⁷ 54 *Federal Register* 4443-4444.

their vessels the night before an early morning departure from their Santa Barbara dock, and passengers had already boarded the *Conception* before the first crewmembers—the second captain and galley hands—arrived between 2200 and midnight the night before the vessel got under way for the accident voyage. After boarding the vessel and stowing their gear, the crew went to sleep. No roving patrol was set, and there were no crewmembers awake on the vessel until the remainder of the crew arrived about 30–40 minutes before getting under way. A captain of another Truth Aquatics vessel stated that it was a regular practice for passengers to board his vessel the night before an early morning departure, but the crew was not required to be aboard until 30 minutes prior to getting under way.

Once the *Conception* was under way en route to Santa Cruz Island during the accident voyage, the second captain and the deckhands went to their bunks (the galley hands had remained in their bunks while the vessel got under way), and the captain operated the helm in the wheelhouse. There was no roving patrol set during the early morning transit. Similarly, the deckhand told law enforcement officials that, when he had been assigned night navigation watches on previous voyages, he was the only crewmember awake and no other watches were set. Current and former crewmembers on the *Conception*, *Vision*, and *Truth* stated that roving patrols were not being maintained on any Truth Aquatics vessels. One captain told investigators that, although he believed that the legal and regulatory requirements for a roving patrol were not being met, it was the way he had been instructed when he joined the vessel. Another captain stated that the requirement for the patrol was a regulation, “but it wasn’t really followed.”

During the investigation, NTSB staff visited other dive boats operating from Southern California ports and harbors and spoke with their owner/operators. During informal discussions, all owners/operators stated that night watches were assigned whenever passengers were aboard, but the procedures for the watches varied greatly. On some of the vessels, crewmembers assigned to the watch spent a majority of their time in a single location—either the wheelhouse or the salon—which does not appear to meet the intent of the regulation.

When asked by investigators, Coast Guard inspectors stated that they could not verify compliance with the roving patrol requirement, since inspections were not conducted during overnight voyages with passengers embarked. There was no requirement for a log for the roving patrol, and thus no records existed to verify that the patrol was being properly implemented. Coast Guard inspection aids and checklists reviewed by the NTSB, such as those contained in the CG-840 TI inspection book and the MSD Santa Barbara “Small Passenger Vessel – T” checklist, did not include line items to verify or discuss regulatory watchstanding requirements or the terms of the COIs. Coast Guard records show that, since 1991, no owner, operator, or charterer has been issued a citation or been fined for failure to post a roving patrol. The NTSB concludes that the Coast Guard does not have an effective means of verifying compliance with roving patrol requirements for small passenger vessels.

The NTSB recognizes that the resources necessary to conduct unannounced, overnight, underway inspections to positively verify roving patrol watchstanding compliance may be impractical. Therefore, other means need to be developed to verify compliance with the roving patrol requirements. For example, at the most basic level, a log containing the time of the roving patrol and the name and signature of the watchstander would give Coast Guard inspectors an indication of the level of compliance when reviewed during inspections. More advanced watchstander management systems are also commercially available and would provide greater credibility to the compliance verification process. A review of logs or watchstander management records during inspections would also provide inspectors the opportunity to discuss the

requirement with owners, operators, and charterers and underscore the importance of the patrol for the safety of passengers. Given the importance of this patrol to the safety of passengers and crew, the NTSB recommends that the Coast Guard develop and implement a means to verify that small passenger vessel owners, operators, and charterers are conducting roving patrols as required by 46 *CFR* Subchapter T.

2.7 Means of Escape

The *Conception* had two means of escape from the bunkroom, both of which led to the salon. The primary access was a spiral staircase from the starboard forward part of the main deck salon to the starboard forward corner of the bunkroom. Anyone trying to escape the bunkroom with a fire in the aft salon would have encountered heavy smoke in the stairway and low visibility conditions. Even if they succeeded in ascending the stairs, the main exit (open doors) from the salon was blocked by the fire. They would have had to find their way through a fire-filled space, with thick, dark smoke and zero visibility, to get outside through the emergency window exits.

The secondary emergency exit for the bunkroom occupants was the square escape hatch on the centerline in the overhead. The *Conception's* escape hatch was accessible from either port or starboard aisles by climbing into one of the top aftermost inboard bunks. This emergency exit opened into the aft part of the salon, where the fire was most intense. In fact, surviving crewmembers reported seeing the whole area around the escape hatch ablaze before abandonment, indicating it was not an option for escaping the bunkroom. As this accident clearly shows, having two emergency escape paths that exit into the same space provides the opportunity for a single hazard to block both. The NTSB concludes that the *Conception* bunkroom's emergency escape arrangements were inadequate because both means of escape led to the same space, which was obstructed by a well-developed fire.

The *Conception* was designed in accordance with the Old T regulations at the time of construction. As such, the vessel was required to have "not less than two avenues of escape from all general areas accessible to the passengers or where the crew may be quartered or normally employed, so located that if one is not available the other may be." There were no additional requirements regarding size, egress times, vertical access, or obstructions. Therefore, the *Conception's* two means of escape from the bunkroom (spiral stairs and escape hatch) leading to the salon met the means of escape requirements in Old T regulations (existing vessels).

The New T regulations for emergency escape, which did not apply to the *Conception* as an existing vessel, require an escape path to be a minimum of 32 inches wide, and the route must facilitate easy movement of a person wearing a lifejacket. New T regulations (new vessels only) also prohibit ladders leading to deck scuttles as a means of escape for vessels this size. The regulations do not require that passengers and crew be able to evacuate within a specific timeframe. Instead, New T regulations (new vessels only) require escapes of a number and dimensions "sufficient for rapid evacuation." Rapid evacuation is not further discussed or defined.

When considering the fire safety aspects regarding the evacuation from occupied spaces both the exit capacity (number and size of exits) and the escape path to reach an area of refuge must be considered. If all escape paths are compromised, then the evacuation fails. The exits and the escape paths are equally important elements of the evacuation plan and must be given consideration as a system. The goal is to maintain a tenable evacuation pathway so that the occupants can make their escape. Coast Guard regulations applicable to the *Conception* do not address the escape path as an element of the fire safety plan. The regulations only consider the

exits from occupied spaces. Although the regulations require vessels to have two exits from an occupied space, spaced as far apart as practicable, the regulations do not preclude having both exits lead to the same compartment, as was the case in the *Conception*. In this circumstance, the salon compartment was the only escape path to exterior (weather) decks. Therefore, because the fire was located in the salon, the passengers were trapped, and the crew was not able to reach them. If an escape hatch had exited to a space other than the salon, optimally directly to the weather deck, some of the occupants in the bunkroom may have been able to escape.

By comparison, in the similar fire aboard the Egyptian vessel *Red Sea Aggressor*, the primary stairway exit was blocked by smoke and fire in the salon, but all of the surviving passengers and crew that were sleeping below deck were able to escape through the emergency escape hatch, which led to a different space than the primary stairs did. Aboard the *Red Sea Aggressor*, the escape led to a forward crew berthing area and up a ladder through a door to the weather deck. All but one of the passengers successfully escaped. The NTSB concludes that Subchapter T (Old and New) regulations are not adequate because they allow for primary and secondary means of escape to exit into the same space, which could result in those paths being blocked by a single hazard. Therefore, the NTSB recommends that the Coast Guard revise 46 *CFR* Subchapter T to require newly constructed small passenger vessels with overnight accommodations to provide a secondary means of escape into a different space than the primary exit so that a single fire should not affect both escape paths. Similarly, the NTSB recommends that the Coast Guard revise 46 *CFR* Subchapter T to require all small passenger vessels with overnight accommodations, including those constructed prior to 1996, to provide a secondary escape path into a different space than the primary exit so that a single fire should not affect both escape paths.

The circumstances of this accident make clear that means of escape that exited to separate or outside spaces, such as the weather deck, may have provided the occupants in the bunkroom a greater opportunity to escape. The NTSB believes it is imperative that operators of similar small passenger vessels act to ensure that secondary means of escape exit to a different space than the primary exit. The NTSB therefore recommends to the Passenger Vessel Association, Sportfishing Association of California, and National Association of Charterboat Operators that, until the Coast Guard requires small passenger vessels with overnight accommodations to provide a secondary means of escape into a different space than the primary exit, share the circumstances of the *Conception* accident with their members and encourage members to voluntarily do so.

Had the bunkroom escape hatch not been blocked by fire, there still may have been difficulties evacuating a large number of people through the hatch in a timely manner. The escape path through the hatch was impeded by the bunks below it. Passengers would have had to climb up a bunk's ladder and onto a bunk to reach the escape, and therefore, the approach to the hatch did not facilitate easy movement of a person through it. The escape path would have been challenging for anyone to navigate without practice and would have been further complicated by low lighting and poor visibility due to smoke from the fire. Further, it would have been extremely difficult to evacuate an injured or unconscious person through the hatch.

The *Conception's* escape hatch met the requirement in the Old T regulations for a second emergency egress pathway from the bunkroom; Old T regulations did not stipulate the size of, egress times from, or vertical access to the hatch, or address the possibility of obstructions. The NTSB concludes that, although designed in accordance with the applicable regulations, the effectiveness of the *Conception's* bunkroom escape hatch as a means of escape was diminished by the location of bunks immediately under the hatch. The NTSB recommends that the Coast Guard review the suitability of 46 *CFR* Subchapter T regulations regarding means of escape to ensure

there are no obstructions to egress on small passenger vessels constructed prior to 1996 and modify regulations accordingly.

2.8 Search-and-Rescue Efforts

The *Conception's* captain was able to transmit only a quick VHF radio distress call before being overwhelmed by smoke and forced out of the vessel's wheelhouse. The crew did not have the opportunity to collect and activate the EPIRB or visual distress signals prior to or after abandoning the *Conception*. The Coast Guard computed the *Conception's* position based on VHF radio direction finders, and although the calculation was about 6.5 miles from the actual position of the *Conception*, it would have been close enough for any search and rescue unit to see the fire, and the position would have been updated with AIS and/or VTS information before any search and rescue unit arrived on scene.

Coast Guard watchstanders heard the captain say he could not breathe and assumed there was a medical emergency, not a fire, on board. Coast Guard watchstanders alerted the closest small boat station at Coast Guard Station Channel Islands Harbor. The Station's boats however, had no advanced life support equipment, so the crew requested assistance from the Ventura County Fire Department. The initial distress call was made at 0314, the call to the Station at 0323.

Once the Command Center understood that the nature of the emergency was fire from the *Grape Escape's* radio call at 0329, they relayed the information to the Station, where the first boat was launched at 0342. A second boat got under way, with an engine company from VCFD, at 0349. Additional resources followed. At the time of the call from the *Conception's* crew on board the *Grape Escape*, the fire was reported to have "fully engulfed" the *Conception*.

The first boats on scene were the Coast Guard's two RB-Ms, making the 27-mile trip at full speed in about 50 minutes. Although outfitted with portable dewatering pumps that could be used for fighting fires, the boats were not capable of fighting a fire of this magnitude. The VCFD engine captain and RB-M coxswains chose to search for survivors in the water and along the shoreline, realizing their limited firefighting capability, and aware that a fire boat was en route. At 0441, the first fire boat arrived on scene. At 0508, the fire was first reported extinguished, although it did reflash at least twice after that report. Search efforts by both surface and air assets found no survivors.

The location of the vessel fire, 27 miles from the California mainland, and the advanced nature of the fire at the time of reporting made for a challenging response. Further, Coast Guard watchstanders did not understand that the emergency was a fire until 15 minutes after the initial mayday call, which slowed the dispatch of firefighting assets. Even if they had known that the emergency was a fire, the location of the vessel prevented a speedy response. It took about 50 minutes to travel there at full speed, and reports from the *Grape Escape* indicated that the vessel was likely beyond saving at the time of the call for help. The NTSB concludes that the emergency response to the accident was appropriate but was unable to prevent the loss of life given the rapid growth of the fire at the time of detection and the location of the *Conception*.

2.9 Oversight

Truth Aquatics was a well-respected operator among regulators, current and former crewmembers, competitors, and passengers. A Coast Guard representative stated that the company

“had a good reputation for being good operators,” and a former captain of the Truth Aquatics dive boat *Vision* described the company’s vessels as “the safest boats on the coast.” Yet, despite its reputation, the NTSB found several unsafe practices on company vessels. NTSB investigators sought to understand how these practices became normalized in a company that, by most accounts, was considered to be a safe and effective operator. In reviewing the company’s policies and procedures, along with the Coast Guard regulations, it is clear that Truth Aquatics had been deviating from required safe practices for some time.

As previously noted, current and former Truth Aquatics employees stated that required roving patrols were not conducted on company vessels, and although the captains and other crewmembers were aware of the requirement for the patrol, they ignored it.

New T regulations (all vessels) require that a credentialed master or mate at all times direct and control the movement of a vessel when under way. However, on occasion, the *Conception*’s captain would assign one of the uncredentialed deckhands to helm watches at night while the vessel was under way when all other crewmembers were asleep, including the captain and second captain. The deckhands would be responsible for directing and controlling the vessel and were instructed to awaken the captain if the engines made unusual noises or if the *Conception* came within 2 miles of other vessels.

Regulations also require that, “prior to getting underway for the first time and at least once every three months,” new crewmembers be instructed on the duties that the crewmember is expected to perform during emergencies, including fire, heavy weather, or man overboard. Truth Aquatics’ *Loss Control Program* document contained crew procedures for these emergencies, and the *Conception* second captain and an alternate second captain, both of whom had been hired in 2019, stated that they had received and reviewed this document prior to joining the vessel. However, the alternate second captain stated that no one verified that he had read and understood the emergency procedures prior to getting underway. The first galley hand, who had begun working aboard the *Conception* about 3 weeks before the accident, had also received the *Loss Control Program* document, but not until just prior to the accident voyage—his fifth or sixth on the vessel. He stated that he wrote down the headings to each of the emergency procedures and asked the captain about them the day before the accident, but the captain deferred discussion to a later time. Other current and former crewmembers stated that there was no formal training for new employees prior to getting underway, and all training was on-the-job, as time allowed.

Regulations further required that the captain conduct sufficient fire drills to ensure that crewmembers were familiar with their duties. The drill logs for the *Conception* were lost in the fire, and thus could not be reviewed for completeness or currency. According to Coast Guard records, the drill log was not up to date during the vessel’s 2017 Coast Guard annual inspection. During interviews, the second captain, first deckhand, and second galley hand stated that they had never participated in a fire drill aboard the *Conception*. The second captain had only been aboard the vessel for 2 months, so it is feasible that a regularly scheduled drill had not yet been conducted. However, the first deckhand and the second galley hand had been aboard since November 2018 and October 2017, respectively, and thus should have been aboard for a fire drill. The first deckhand had participated in a drill aboard another Truth Aquatics vessel during a Coast Guard inspection, but he had never pulled out a fire hose or “done a dry run on anything” on the *Conception*.

A passenger safety orientation was required by regulation to be conducted on a small passenger vessel “before getting underway on a voyage or as soon as practicable thereafter.”

However, during voyages with early morning departures, passenger safety briefings on Truth Aquatics' vessels were routinely conducted hours after getting under way once the passengers had awoken and the vessel had reached its first anchoring site. On the accident voyage, passengers boarded prior to many of the crewmembers and before the vessel left its berth in Santa Barbara. Between the time that the vessel got under way and when the briefing was conducted, the vessel transited open water in darkness for several hours while passengers were sleeping. Passengers were on board for up to 10 hours before they had been verbally briefed on critical information that might be needed in the event of an emergency on board the vessel.

Because passengers boarded the vessel the night before departure, there was ample opportunity to conduct the briefing before getting under way. Instead, a laminated "Welcome Aboard" card was available on the *Conception* when passengers boarded, and, when combined with the lifejacket-donning instructions posted in each bunk, the card met the requirements of the safety pamphlet alternative to the orientation, with the exception that the location of emergency exits was not provided. However, the pre-underway announcement required in conjunction with the pamphlet was not conducted.

A habitual disregard for rules, policies, and procedures predisposes the crew and passengers to an unsafe environment. Knowingly and routinely violating policies and procedures can be characterized as *normalization of deviance*, which occurs when people within an organization become so insensitive to deviant, or non-standard, practices that it no longer feels "wrong." This insensitivity typically occurs over time and does not become apparent until all the critical factors line up and disaster occurs.

The pathway to normalization of deviance often starts with shortcuts. People eventually begin to rationalize these shortcuts, particularly when negative consequences or penalties do not appear to exist. If there are no measures or attempts to verify rules and procedures are being followed appropriately, these rationalized shortcuts can be normalized for a long time.³⁸ Oftentimes, the shortcuts go unnoticed on a large scale, normalizing the behavior and changing company/customer expectations and ultimately jeopardizing safety. This behavior is often related to the environment and conditions surrounding the work (time pressures, inadequate number of crew, insufficient crew training, prioritization of goals, or fatigue) and does not necessarily mean that the operator or person deviating from safety standards or policies was doing so intentionally or out of gross negligence. Additionally, each minor deviation does not necessarily result in an immediate negative consequence; however, over time, each slight deviation has a cumulative negative effect on safety.³⁹ A person's or organization's deviation may become greater as they continue to push the limit over time because the potential negative consequence from the deviation has not materialized.

Often, deficient behaviors and patterns are caused by varying environmental factors, which often start at the company—not hiring enough crewmembers to adequately complete the job, hiring crewmembers lacking the experience necessary to carry out their duties without the assistance of other crewmembers, or not providing adequate oversight to ensure the crew is working safely and effectively to company standards. The owner of Truth Aquatics stated that there were no company-wide operating procedures; these were left to the captains of each vessel to establish and

³⁸ Dr. Rich Gasaway, Situational Awareness Matters, "The Normalization of Deviance," <https://www.samatters.com/the-normalization-of-deviance/>.

³⁹ A. Lebbon & S. Sigurdsson (2017), *Behavioral Perspectives on Variability in Human Behavior as Part of Process Safety*, *Journal of Organizational Behavior Management*, 37:3-4 261-282.

manage. Watchstanding, crew training, and operating procedures, including hiring, training, and dismissal of crewmembers, were the responsibility of the captains of the company's vessels. While this practice is not uncommon among small-scale operators, it does not absolve the company from its responsibility to ensure the safety of its passengers and crew. Entrusting the operation of the vessel to a single individual with little to no verification of compliance with regulations, policies, and procedures, can lead to non-conforming conditions on a vessel. The noted lax practices were not single incidents; they were common practice. If the company had been actively engaged in ensuring the safe practices required by regulations were being followed, most notably the requirement for a roving patrol, the fire would have been discovered earlier, and the consequences of this onboard fire likely would have been greatly diminished. The NTSB concludes that Truth Aquatics provided ineffective oversight of its vessels' operations, which jeopardized the safety of crewmembers and passengers.

When properly implemented, an effective tool for safety oversight is a safety management system (SMS), which is a comprehensive, documented system to enhance safety for a company and its vessels. Safety of operations and compliance with mandatory rules and regulations related to the safe operations is the objective behind every action and decision by both those who oversee procedures and those who carry them out. Regardless of the size of the company, an SMS ensures standardized and unambiguous procedures for each crewmember during both routine and emergency operations. Duties and responsibilities are specified, and supervisory and subordinate chains of command delineated. An SMS also calls for the creation of plans to respond to a range of possible emergency situations, with crewmember duties and responsibilities specified. Finally, an SMS requires procedures for the identification and correction of non-conformities and includes an audit process for management to ensure policies and procedures are being followed.

The Coast Guard is required by regulation to ensure that US-flagged vessels engaged in oceangoing international service have an SMS, but there is no SMS requirement for the domestic passenger vessel fleet. Thus, Truth Aquatics was not required to have an SMS for its vessels. The company's *Loss Control Program* contained some of the elements of an SMS. However, the company code did not have procedures for normal operations. While the company had procedures for identifying and correcting non-conformities, it did not have an audit process. Further, although the program included procedures for reporting accidents, there was no requirement to develop procedures to prevent future occurrences of accidents.

Had an SMS been in place at Truth Aquatics, it would have likely included procedures for roving patrols that complied with regulations and a company-involved audit process for identifying and correcting non-conformities, when they existed, with the watch requirements. Also, following the battery fire that had occurred on the *Vision* about a year prior to the accident, SMS postaccident procedures could have led the company to identify battery charging as a potential risk and take measures to prevent such fires, as it has done in the wake of the *Conception* fire. The NTSB concludes that had an SMS been implemented, Truth Aquatics could have identified unsafe practices and fire risks on the *Conception* and taken corrective action before the accident occurred. Therefore, the NTSB recommends that Truth Aquatics implement an SMS for its fleet to improve safety practices and minimize risk.

The NTSB has long advocated for the implementation of SMSs. Following the 2010 contact of the passenger ferry *Andrew J. Barberi* with a terminal at Staten Island, New York, in which 50 people were injured, the NTSB issued Safety Recommendation M-12-3 to the Coast Guard:

Require all operators of U.S.-flag passenger vessels to implement SMS taking into account the characteristics, methods of operation, and nature of service of these vessels, and, with respect to ferries, the sizes of the ferry systems within which the vessels operate.

After the Coast Guard initially responded that it was developing appropriate regulations for all US-flagged passenger vessels (part of Public Law 111–281), the NTSB classified Safety Recommendation M-12-3 as “Open—Acceptable Response” in May 2013. However, in April 2014, following the investigation into the 2013 contact of the passenger vessel *Sea Streak Wall Street* with a pier in Manhattan, New York, and after more than 3 years had passed since Congress authorized the Coast Guard to mandate SMSs, the NTSB reclassified the recommendation “Open—Unacceptable Response.”

In its most recent correspondence, dated October 18, 2016, the Coast Guard wrote that it continued to work on developing the necessary regulations to implement the requirements for an SMS in all passenger vessels. On February 17, 2017, the NTSB replied that it had been over 6 years (at that time) since Congress authorized the Coast Guard to mandate SMSs, and it had been over 3 years since the Coast Guard indicated to the NTSB its intent to initiate rulemaking. Accordingly, Safety Recommendation M-12-3 remained classified “Open—Unacceptable Response.” The NTSB also requested that the Coast Guard expedite action to address this recommendation.

The NTSB reiterated Safety Recommendation M-12-3 again in late 2019 following the investigation into the 2018 fire aboard the small passenger vessel *Island Lady*. To date, the Coast Guard has not issued the regulations authorized in the 2010 law, although the service has indicated an intention to develop the regulations and has issued guidance encouraging operators to voluntarily implement SMSs.

The NTSB continues to believe that an SMS is an essential tool for enhancing safety on board all US passenger vessels and that the Coast Guard is the appropriate authority to ensure implementation and enforcement of such a system. In the case of the *Conception* and Truth Aquatics, a Coast Guard requirement for an SMS would likely have ensured greater adherence to watchstanding requirements, an appropriate response to a fire emergency, record keeping of watchkeeping and training documents, and the development of risk mitigation measures. The NTSB concludes that implementing SMS on all domestic passenger vessels would enhance operators’ ability to achieve a higher standard of safety. Therefore, the NTSB reiterates Safety Recommendation M-12-3.

3 Conclusions

3.1 Findings

1. Weather and sea conditions were not factors in the accident.
2. The use of alcohol or other tested-for drugs by the *Conception* deck crew was not a factor in the accident.
3. The origin of the fire on the *Conception* was likely inside the aft portion of the salon.
4. Although a definitive ignition source cannot be determined, the most likely ignition sources include the electrical distribution system of the vessel, unattended batteries being charged, improperly discarded smoking materials, or another undetermined ignition source.
5. The exact timing of the ignition cannot be determined.
6. Most of the victims were awake but could not escape the bunkroom before all were overcome by smoke inhalation.
7. The fire in the salon on the main deck would have been well developed before the smoke activated the smoke detectors in the bunkroom.
8. Although the arrangement of detectors aboard the *Conception* met regulatory requirements, the lack of smoke detectors in the salon delayed detection and allowed for the growth of the fire, precluded firefighting and evacuation efforts, and directly led to the high number of fatalities in the accident.
9. Interconnected smoke detectors in all accommodation spaces on Subchapter T and Subchapter K vessels would increase the chance that fires will be detected early enough to allow for successful firefighting and the evacuation of passengers and crew.
10. The absence of the required roving patrol on the *Conception* delayed detection and allowed for the growth of the fire, precluded firefighting and evacuation efforts, and directly led to the high number of fatalities in the accident.
11. The US Coast Guard does not have an effective means of verifying compliance with roving patrol requirements for small passenger vessels.
12. The *Conception* bunkroom's emergency escape arrangements were inadequate because both means of escape led to the same space, which was obstructed by a well-developed fire.
13. Subchapter T regulations (Old and New) are not adequate because they allow for primary and secondary means of escape to exit into the same space, which could result in those paths being blocked by a single hazard.
14. Although designed in accordance with the applicable regulations, the effectiveness of the *Conception*'s bunkroom escape hatch as a means of escape was diminished by the location of bunks immediately under the hatch.
15. The emergency response by the Coast Guard and municipal responders to the accident was appropriate but was unable to prevent the loss of life given the rapid growth of the fire at the time of detection and location of the *Conception*.

16. Truth Aquatics provided ineffective oversight of its vessels' operations, which jeopardized the safety of crewmembers and passengers.
17. Had a safety management system been implemented, Truth Aquatics could have identified unsafe practices and fire risks on the *Conception* and taken corrective action before the accident occurred.
18. Implementing safety management systems on all domestic passenger vessels would further enhance operators' ability to achieve a higher standard of safety.

3.2 Probable Cause

The National Transportation Safety Board determines that the probable cause of the accident on board the small passenger vessel *Conception* was the failure of Truth Aquatics, Inc., to provide effective oversight of its vessel and crewmember operations, including requirements to ensure that a roving patrol was maintained, which allowed a fire of unknown cause to grow, undetected, in the vicinity of the aft salon on the main deck. Contributing to the undetected growth of the fire was the lack of a United States Coast Guard regulatory requirement for smoke detection in all accommodation spaces. Contributing to the high loss of life were the inadequate emergency escape arrangements from the vessel's bunkroom, as both exited into a compartment that was engulfed in fire, thereby preventing escape.

4 Recommendations

4.1 New Recommendations

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

To the US Coast Guard

Revise Title 46 *Code of Federal Regulations* Subchapter T to require that newly constructed vessels with overnight accommodations have smoke detectors in all accommodation spaces. (M-20-14)

Revise Title 46 *Code of Federal Regulations* Subchapter T to require that all vessels with overnight accommodations currently in service, including those constructed prior to 1996, have smoke detectors in all accommodation spaces. (M-20-15)

Revise Title 46 *Code of Federal Regulations* Subchapter T and Subchapter K to require all vessels with overnight accommodations, including vessels constructed prior to 1996, have interconnected smoke detectors, such that when one detector alarms, the remaining detectors also alarm. (M-20-16)

Develop and implement an inspection procedure to verify that small passenger vessel owners, operators, and charterers are conducting roving patrols as required by Title 46 *Code of Federal Regulations* Subchapter T. (M-20-17)

Revise Title 46 *Code of Federal Regulations* Subchapter T to require newly constructed small passenger vessels with overnight accommodations to provide a secondary means of escape into a different space than the primary exit so that a single fire should not affect both escape paths. (M-20-18)

Revise Title 46 *Code of Federal Regulations* Subchapter T to require all small passenger vessels with overnight accommodations, including those constructed prior to 1996, to provide a secondary means of escape into a different space than the primary exit so that a single fire should not affect both escape paths. (M-20-19)

Review the suitability of Title 46 *Code of Federal Regulations* Subchapter T regulations regarding means of escape to ensure there are no obstructions to egress on small passenger vessels constructed prior to 1996 and modify regulations accordingly. (M-20-20)

To the Passenger Vessel Association, Sportfishing Association of California, and National Association of Charterboat Operators

Until the US Coast Guard requires all passenger vessels with overnight accommodations, including vessels constructed prior to 1996, to have smoke detectors in all accommodation spaces, share the circumstances of the *Conception* accident with your members and encourage your members to voluntarily install

interconnected smoke and fire detectors in all accommodation spaces such that when one detector alarms, the remaining detectors also alarm. (M-20-21)

Until the US Coast Guard requires small passenger vessels with overnight accommodations to provide a secondary means of escape into a different space than the primary exit, share the circumstances of the *Conception* accident with your members and encourage your members to voluntarily do so. (M-20-22)

To Truth Aquatics

Implement a safety management system for your fleet to improve safety practices and minimize risk. (M-20-23)

4.2 Recommendation Reiterated in this Report

As a result of its investigation of this accident, the National Transportation Safety Board reiterates Safety Recommendation M-12-3, which is currently classified as “Open—Unacceptable Response”:

To the US Coast Guard

Require all operators of U.S.-flag passenger vessels to implement SMS, taking into account the characteristics, methods of operation, and nature of service of these vessels, and, with respect to ferries, the sizes of the ferry systems within which the vessels operate. (M-12-3)

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

ROBERT L. SUMWALT, III
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JENNIFER HOMENDY
Member

BRUCE LANDSBERG
Vice Chairman

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Member

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Member

Report Date: October 20, 2020

Appendix A Investigation

The National Transportation Safety Board (NTSB) learned of the accident from the US Coast Guard on the morning of September 2, 2019. A team of four investigators, NTSB Board Member Jennifer Homendy, and support staff arrived on scene in Santa Barbara, California, the evening of September 2 and the following day. The investigative team consisted of specialists in engineering, operations, survival factors and emergency response, and fire and explosions; the team was further supported by a staff meteorologist and an engineer specializing in electronic data. Investigators from the local offices of the Coast Guard Investigative Service (CGIS), Federal Bureau of Investigations (FBI), Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF), and the Santa Barbara Fire and Police Departments, as well as the district attorney for Santa Barbara County and an Assistant US Attorney, were already on scene before NTSB personnel arrived.

The NTSB investigated the accident under the authority of Title 49 *United States Code (USC)* 1131(a)(1)(E). The Coast Guard, Truth Aquatics, Inc., Santa Barbara County Sheriff's Office, and Santa Barbara County Fire Department were named as parties to the NTSB investigation. At no time was the NTSB advised by any law enforcement agency, the Department of Justice, or other federal authority of any indication or suspicion that the accident was caused by an intentional act, and there was no request from either the Attorney General or any other federal agency to the NTSB to relinquish investigative priority under 49 *USC* 1131(a)(2)(B). Accordingly, the NTSB retained investigative priority for the *Conception* accident throughout.

On September 4, while on scene, NTSB investigators, accompanied by other federal investigators, interviewed the owner and three of the surviving crew of the *Conception*. Following those interviews, the NTSB was informed by the Coast Guard of its intent to pursue criminal proceedings against the captain of the *Conception* based on the revelation during the three crew interviews that there was no roving patrol established on the *Conception* at the time of the accident, an operational condition on their Certificate of Inspection. The interview of the captain, who had voluntarily made himself available to NTSB investigators, was deferred to the morning of September 5. The Coast Guard and the Santa Barbara Sheriff's Office and Fire Department representatives recused themselves from further NTSB interviews on scene to support the parallel criminal investigation.

The following morning, on September 5, the captain of the *Conception* presented himself to be interviewed by NTSB investigators. The Assistant US Attorney assigned to the case requested the NTSB not interview the captain of the *Conception* out of concern that the interview could hinder his ability to bring criminal charges against the captain. Additionally, the Assistant US Attorney requested that NTSB investigators not interview the first galley hand, who was hospitalized at the time, or any Truth Aquatics employee responsible for operations. The NTSB obtained significant information from the other crewmembers; however, the *Conception's* captain had many years of experience on the same vessel, and NTSB interviews with the owner of Truth Aquatics and current and past crewmembers indicated the captain was intimately familiar with the vessel's history, operations, systems, and maintenance. The owner and surviving crewmembers therefore referred many of investigators' questions to the captain, which remain unanswered.

On September 5, NTSB investigators interviewed several first responders, including personnel from the Ventura County Fire Department, Coast Guard Station Channel Harbor Islands, and Channel Islands Harbor Patrol. On September 6, the Coast Guard inspector who most recently

inspected the *Conception* was interviewed by an NTSB investigator. In the following days, multiple witnesses who submitted tips and information to the NTSB, current and former Truth Aquatics crewmembers, former passengers, contractors, and service providers were also interviewed by NTSB investigators. However, as local and national news spread related to the parallel criminal investigation, with the NTSB often erroneously being listed as a part of the criminal investigation, NTSB investigators found that many persons who had previously contacted the NTSB with historical and relevant information were later unwilling to speak to the NTSB or had already been interviewed by law enforcement investigators.

From September 8 to 10, 2019, the Assistant US Attorney served search warrants on the offices and two remaining vessels of Truth Aquatics, which the NTSB did not attend. The search warrants resulted in the seizure of thousands of pages of documents and records. Computers, security camera servers, and items, such as fans, smoke detectors, and heat sensors, from each vessel were also seized. Truth Aquatics was not able to provide any record or information to NTSB investigators after that point.

While recovery and salvage efforts of the *Conception* wreckage were ongoing, Truth Aquatics allowed NTSB investigators access to its two remaining vessels: the *Truth* and the *Vision*. NTSB investigators primarily examined the similar vessel, the *Vision*, inspecting construction material, furnishings, general arrangement, firefighting and lifesaving equipment, and escape and egress arrangements.

Under the memorandum of understanding between the FBI and the NTSB, the FBI Evidence Response Team was tasked with the collection of all evidence, materials, and personal effects and the processing of items recovered from the wreckage site and the wreckage itself. There was good cooperation between the NTSB and the FBI Evidence Response Team.

The wreckage of the *Conception*, along with equipment and debris recovered from the sea floor, was recovered by salvors on September 12 and was transferred by barge to Port Hueneme, California, where it could be examined on Naval Base Ventura County, a secure location. Once the wreckage was transferred to a secure lot on September 13, NTSB investigators were instructed to return to their duty stations to await completion of construction of securing apparatus and scaffolding around the hull of the *Conception*.

Five NTSB investigators returned to the examination site on September 25–26 to commence examination of the wreckage and recovered debris. The US Attorney's Office prohibited Truth Aquatics, a party representative to the NTSB investigation, from attending the wreckage examination. The owner of Truth Aquatics, who had intricate knowledge of the vessel and was a major contributor in the design and building of the *Conception*, would have been essential in assisting NTSB investigators in identifying pieces of wreckage and describing operations, the vessel layout, engineering components, and the differences between the *Conception* and the similar vessel *Vision*.

At the examination site, NTSB investigators found that most loose items contained within the hull of the *Conception* had been removed, and items determined by law enforcement investigators to be non-relevant were placed into large plastic bags for disposal. Larger items, such as engine room components recovered from the seafloor, were placed back into the hull where they were known to have been fitted. The remaining relevant and large items and structural sections of the vessel, as determined by law enforcement investigators, were laid out on a tarp with measured markings. NTSB investigators were not invited to, nor did they participate in, the identification and removal of objects from the hull of the *Conception* and the determination of the materials of

relevancy into the origin and cause of the fire. The owner of Truth Aquatics, who was permitted to inspect the wreckage at a later date with insurance investigators, advised the NTSB during the technical review of the fire and explosions factual report that there were “many parts of upper deck...discovered during [Truth Aquatics’] site visit in piles and trash bags off to the side.”

Multiple personal electronic devices, including smart phones, tablets, and video and still cameras were either recovered with the wreckage or the victims or off the seafloor. Each device was photographed and documented by the FBI Evidence Response Team. Many of the devices recovered showed minimal signs of heat damage, although all had been exposed to sea water. The FBI retained custody of each device for examination and, if possible, extraction of any relevant photos, video, and information contained on the devices. At the time of this report, material had been extracted from only two devices: a tablet, which contained no relevant information, and a smart phone, which belonged to a passenger and contained pictures and video taken during the accident voyage.

From November 18–21, NTSB investigators returned to Southern California to interview staff at Coast Guard Sector Los Angeles/Long Beach and Marine Safety Unit Santa Barbara. Additionally, NTSB investigators also visited three small passenger vessels with overnight accommodations and their owners and witnessed a Coast Guard small passenger vessel inspection.

Coast Guard headquarters staff were also interviewed by NTSB investigators between November 2019 and February 2020. On February 13, 2020, the FBI provided NTSB investigators a hard drive with scans of all documents and records seized through the various search warrants. No electronic evidence recovered from computers and servers was provided to the NTSB. All scanned documents and photos taken from the FBI Evidence Response Team were accompanied by a letter stating that written consent must be given prior to any public release of evidence seized through the search warrants.

A Coast Guard marine board of investigation (MBI) was established pursuant the authority contained in 46 *USC* 6301 requiring the board to convene as soon as practicable to inquire into all aspects of the *Conception* casualty. As of the date of this report, a formal MBI has yet to convene.

Appendix B

Consolidated Recommendation Information

Title 49 *United States Code (USC)* 1117(b) requires the following information on the recommendations in this report.

For each recommendation—

(1) a brief summary of the Board’s collection and analysis of the specific accident investigation information most relevant to the recommendation;

(2) a description of the Board’s use of external information, including studies, reports, and experts, other than the findings of a specific accident investigation, if any were used to inform or support the recommendation, including a brief summary of the specific safety benefits and other effects identified by each study, report, or expert; and

(3) a brief summary of any examples of actions taken by regulated entities before the publication of the safety recommendation, to the extent such actions are known to the Board, that were consistent with the recommendation.

To the US Coast Guard

M-20-14

Revise Title 46 *Code of Federal Regulations* Subchapter T to require that newly constructed vessels with overnight accommodations have smoke detectors in all accommodation spaces.

Information that addresses the requirements of 49 *USC* 1117(b), as applicable, can be found in section [2.5 Fire Detection](#). Information supporting (b)(1) can be found on pages 62–64; (b)(2) and (b)(3) are not applicable.

M-20-15

Revise Title 46 *Code of Federal Regulations* Subchapter T to require that all vessels with overnight accommodations currently in service, including those constructed prior to 1996, have smoke detectors in all accommodation spaces.

Information that addresses the requirements of 49 *USC* 1117(b), as applicable, can be found in section [2.5 Fire Detection](#). Information supporting (b)(1) can be found on pages 62–64; (b)(2) and (b)(3) are not applicable.

M-20-16

Revise Title 46 *Code of Federal Regulations* Subchapter T and Subchapter K to require all vessels with overnight accommodations, including vessels constructed prior to 1996, have interconnected smoke detectors, such that when one detector alarms, the remaining detectors also alarm.

Information that addresses the requirements of 49 *USC* 1117(b), as applicable, can be found in section [2.5 Fire Detection](#). Information supporting (b)(1) can be found on pages 62–64; (b)(2) and (b)(3) are not applicable.

M-20-17

Develop and implement an inspection procedure to verify that small passenger vessel owners, operators, and charterers are conducting roving patrols as required by Title 46 *Code of Federal Regulations* Subchapter T.

Information that addresses the requirements of 49 *USC* 1117(b), as applicable, can be found in section [2.6 Roving Patrol](#). Information supporting (b)(1) can be found on pages 65–67; (b)(2) and (b)(3) are not applicable.

M-20-18

Revise Title 46 *Code of Federal Regulations* Subchapter T to require newly constructed small passenger vessels with overnight accommodations to provide a secondary means of escape into a different space than the primary exit so that a single fire should not affect both escape paths.

Information that addresses the requirements of 49 *USC* 1117(b), as applicable, can be found in section [2.7 Means of Escape](#). Information supporting (b)(1) can be found on pages 67–69; (b)(2) and (b)(3) are not applicable.

M-20-19

Revise Title 46 *Code of Federal Regulations* Subchapter T to require all small passenger vessels with overnight accommodations, including those constructed prior to 1996, to provide a secondary means of escape into a different space than the primary exit so that a single fire should not affect both escape paths.

Information that addresses the requirements of 49 *USC* 1117(b), as applicable, can be found in section [2.7 Means of Escape](#). Information supporting (b)(1) can be found on pages 67–69; (b)(2) and (b)(3) are not applicable.

M-20-20

Review the suitability of Title 46 *Code of Federal Regulations* Subchapter T regulations regarding means of escape to ensure there are no obstructions to egress on small passenger vessels constructed prior to 1996 and modify regulations accordingly.

Information that addresses the requirements of 49 *USC* 1117(b), as applicable, can be found in section [2.7 Means of Escape](#). Information supporting (b)(1) can be found on pages 67–69; (b)(2) and (b)(3) are not applicable.

To the Passenger Vessel Association, Sportfishing Association of California, and National Association of Charterboat Operators

M-20-21

Until the US Coast Guard requires all passenger vessels with overnight accommodations, including vessels constructed prior to 1996, to have smoke detectors in all accommodation spaces, share the circumstances of the *Conception* accident with your members and encourage your members to voluntarily install interconnected smoke and fire detectors in all accommodation spaces such that when one detector alarms, the remaining detectors also alarm.

Information that addresses the requirements of 49 *USC* 1117(b), as applicable, can be found in section [2.5 Fire Detection](#). Information supporting (b)(1) can be found on pages 62–64; (b)(2) and (b)(3) are not applicable.

M-20-22

Until the US Coast Guard requires small passenger vessels with overnight accommodations to provide a secondary means of escape into a different space than the primary exit, share the circumstances of the *Conception* accident with your members and encourage your members to voluntarily do so.

Information that addresses the requirements of 49 *USC* 1117(b), as applicable, can be found in section [2.7 Means of Escape](#). Information supporting (b)(1) can be found on pages 67–69; (b)(2) and (b)(3) are not applicable.

To Truth Aquatics, Inc.

M-20-23

Implement a safety management system for your fleet to improve safety practices and minimize risk. (M-20-X)

Information that addresses the requirements of 49 *USC* 1117(b), as applicable, can be found in section [2.9 Oversight](#). Information supporting (b)(1) can be found on pages 69–73; (b)(2) and (b)(3) are not applicable.

Appendix C

Small Passenger Vessel Casualty Data Study

The NTSB examined the frequency of marine accidents for small passenger vessels similar to the *Conception* and to assess the risk among different types of small passenger vessels operating domestically over the past two decades. A data report for incidents involving small passenger vessels was produced by analyzing vessel events (such as fires), personnel casualty (fatality and injury), and other incident data from the Coast Guard's Marine Information for Safety and Law Enforcement (MISLE) database for the period 2002-2019, which included small passenger vessels regulated under Subchapters T and K.⁴⁰

The report showed that, as of March 2020, there were a total of 9,554 active small passenger vessels of all types. Of these, 31 percent (3,002) had a hull constructed of fiberglass-reinforced plastic; 16 percent (1,503) were constructed of wood; and less than 1 percent (3) were fiberglass over wood, like the *Conception* (the remainder were primarily constructed of aluminum and steel, with some of rubber, or other materials).

There were 1,583 individual small passenger vessels involved in 2,710 incidents captured in the personnel casualty files from 2002-2019. However, in order to build a more complete set of incident data for small passenger vessels, the NTSB appended all investigations that involved fatal and injury incidents in small passenger vessels from the personnel casualty data to those documented in an incident investigation data file provided by the Coast Guard, and identified a total of 10,729 unique incidents. Each incident can have multiple events but only one initial event. Of the 10,729 incidents, the most frequent initial event type documented was "material failure/malfunction," which represented 43 percent (4,575 incidents) of events, while fire represented 2 percent (163 incidents). Of all the small passenger vessels involved in the incidents not linked to the initial event type "personnel casualty," just over 1 percent (97 vessels) were attributed to vessels defined as diving boats, and the initiating event for 65 of these 97 diving boats was "hull/machinery/equipment damage" ([table 5](#)).

⁴⁰ (a) Data Report: Incidents Involving Small Passenger Vessels (2002-2019), NTSB, Safety Research Division, August 17, 2020. This report and other additional information about the *Conception* accident investigation are available in the public docket by accessing the Docket Management System at www.nts.gov with the identification number DCA19MM047. (b) Vessels regulated under Subchapter T include small passenger vessels that carry 150 passengers or less, or that have overnight accommodations for less than 50 passengers. Vessels regulated under Subchapter K include the largest of small passenger vessels, which carry more than 150 passengers, or more than 49 passengers overnight.

Table 5. Number of small passenger vessels by initial event type based on the NTSB classification's ten most common vessel types

NTSB Classification of Initial Event Types	General	Ferry	Excursion/Tour Vessel	Diving Vessel (Recreational)	Charter Fishing Vessel	Amphibious Vessel	Sailing Vessel	Crew Boat	Offshore Supply Vessel	Water Taxi	All others	Total	Percent
Hull/Machinery/Equipment Damage	3,593	710	421	65	157	291	85	92	266	92	266	5,837	67.0
Contact/Grounding/Stranding	1,204	16	157	20	39	21	70	76	40	29	108	1,900	21.8
Collision	202	20	26	4	8	2	4	19	16	16	11	328	3.8
Fire/Explosion	108	10	14	1	6	1	4	10	4	2	12	172	2.0
Others ⁴¹	109	7	8	4	3	0	1	9	8	2	10	161	1.8
Vessel Maneuver ⁴²	98	5	16	2	2	1	5	1	4	2	7	143	1.6
Flooding	88	7	10	1	7	4	3	4	4	1	8	137	1.6
Capsizing/Listing	20	0	5	0	2	0	1	1	0	1	4	34	0.4
Total	5,422	985	657	97	224	320	173	212	141	145	426	8,712	100
Percent of Total	62.2	10.3	7.5	1.1	2.6	3.7	2	2.4	1.6	1.7	4.9	100	

There were 668 deaths and 2,800 injuries (3,488 total) recorded over the 18-year period. Passenger casualties represented a much higher percentage than crew casualties, with 600 deaths and 2,232 injuries. However, the report stated that 836 of these casualties were not related to vessel-specific incidents, including: noncontact injury, existing medical condition event, overexertion injury, diseases, and assault, homicide, suicide, or self-inflicted injury. Of note, the report indicated that there were 155 deaths and 242 injuries due to “noncontact injury” associated with diving.

The report provided fatality and injury data distributed by data file vessel type. Vessels defined as “General” represented over 60 percent of the total number of vessels, while “Diving Vessel (Recreational)” represented 9 percent of the total ([table 6](#)).

⁴¹ The category “others” included “abandonment,” “discharge/release – pollution,” and “sinking.”

⁴² The NTSB Office of Marine Safety categorizes “vessel maneuver” as either “collision,” “contact,” or “grounding/stranding.” In this table, staff kept the original initial event type.

Table 6. Fatalities and injuries by vessel type

Vessel Type	Fatalities and Injuries	Percent
General	2,081	60
Excursion/Tour Vessel	345	10
Diving Vessel (Recreational)	324	9
Charter Fishing Vessel	135	4
Ferry	121	3
Sailing Vessel	115	3
Crew Boat	62	2
Water Taxi	61	2
Parasailing Vessel	60	2
Gaming Vessel	33	1
Harbor Cruise Vessel	33	1
Amphibious Vessel	30	1
Offshore Supply Vessel	27	1
All other types ⁴³	41	1
Total	3,468	100

Investigators sought to determine if data over the 17-year period indicated that diving vessels had a greater frequency of casualties or incidents than other small passenger vessel types, and if so, what the initiating events leading to them were. However, this could not be determined from the MISLE data, since in many cases, MISLE vessel event and personnel casualty data on small passenger vessels were incomplete and inconsistently recorded, making it impossible to compare small passenger vessel types by frequency of incidents or casualties over the period of interest (2002-2019). In addition, the Coast Guard was unable to provide a population of vessel types by year, which precluded any calculation of accident or fatal accident rates by vessel and event types. Further, the event types in many cases did not provide sufficient detail, and initiating events were sometimes incorrectly documented. Finally, missing or incomplete data made it impossible to reconcile the vessel event and personnel casualty data.

⁴³ All other types include River Cruise Vessel, Ocean Cruise Vessel, Party/Head Boat (other than fish), Passenger Barge, Attraction Vessel, Fish Catching Vessel, Special Purpose Ship, Work Boat, Amphibious Vessel (DUKW, etc.), Lift Boat, Oil Recovery Vessel, and Small Watercraft. From 2002-2019, 41 fatalities and injuries occurred in these small passenger vessels.

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