NATIONAL TRANSPORTATION SAFETY BOARD

Office of Marine Safety

Washington, DC

August 19, 2020

Group Chairman's Factual Report

Operations

1. EVENT SUMMARY

Location: Off Channel Islands; 26 nautical miles offshore of Ventura, California
Date: September 2, 2019
Type: Fire/explosion
NTSB #: DCA19MM047

2. GROUP MEMBERS

Chairman: Andrew Ehlers, Marine Accident Investigator
National Transportation Safety Board
490 L'Enfant Plaza SW
Washington, DC 20594

And no others.

NOTE: This report was reissued on November 4, 2020, with a correction to the toxicology information on page 18.

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3. SUMMARY

On Monday, September 2, 2019, about 0314 Pacific daylight time, US Coast Guard Sector Los Angeles (LA)/Long Beach received a distress call from the 75-foot small passenger vessel *Conception*. 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. The *Conception* was carrying 39 persons, 6 of whom were crew.

The wood and fiberglass vessel had three levels: the upper deck, which included the wheelhouse, two crew staterooms, and a sun deck; the main deck, which included a salon with a galley and a large exterior deck; and the lower deck within the hull, which included passenger berthing (bunkroom), a shower room, an engine room, and a lazarette.

Figure 1. Preaccident photograph of the *Conception* (Source: www.seawayboats.com)

At the time the fire started, 5 crewmembers were asleep in their bunks in the wheelhouse and in the crew staterooms on the upper deck, and 1 crewmember and all 33 passengers were asleep in the bunkroom. A crewmember sleeping in an upper deck stateroom was awakened by a noise and got up to investigate. He saw a fire at the aft end of the sun deck, rising up from the salon compartment below. The crewmember alerted the four other crewmembers sleeping on that deck. As crewmembers awoke, the captain radioed a quick distress message to the Coast Guard before evacuating the smoke-filled wheelhouse.

Unable to use the aft ladder, which was on fire, the crewmembers jumped down to the main deck (one crewmember broke his leg when he jumped) and tried to access the salon to reach the passengers below. The salon was fully engulfed by fire at the aft end and by thick smoke in the forward end. Unable to open a window at the forward end of the salon and overwhelmed by smoke

from the fire, the crew jumped overboard.

Two crewmembers swam to the stern and re-boarded the vessel. Access to the salon through the aft corridor was blocked by fire, so, along with the captain who had also swum to the stern, they launched a small skiff and picked up the remaining two crewmembers in the water. They 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. No survivors were found.

About 78 minutes after the initial distress call, Coast Guard and other first responder boats arrived on scene to extinguish the fire and search for survivors. Helicopters also aided in search efforts. The vessel burned to the waterline and, just after daybreak, sank in about 60 feet of water. Thirty-three passengers and one crewmember died.

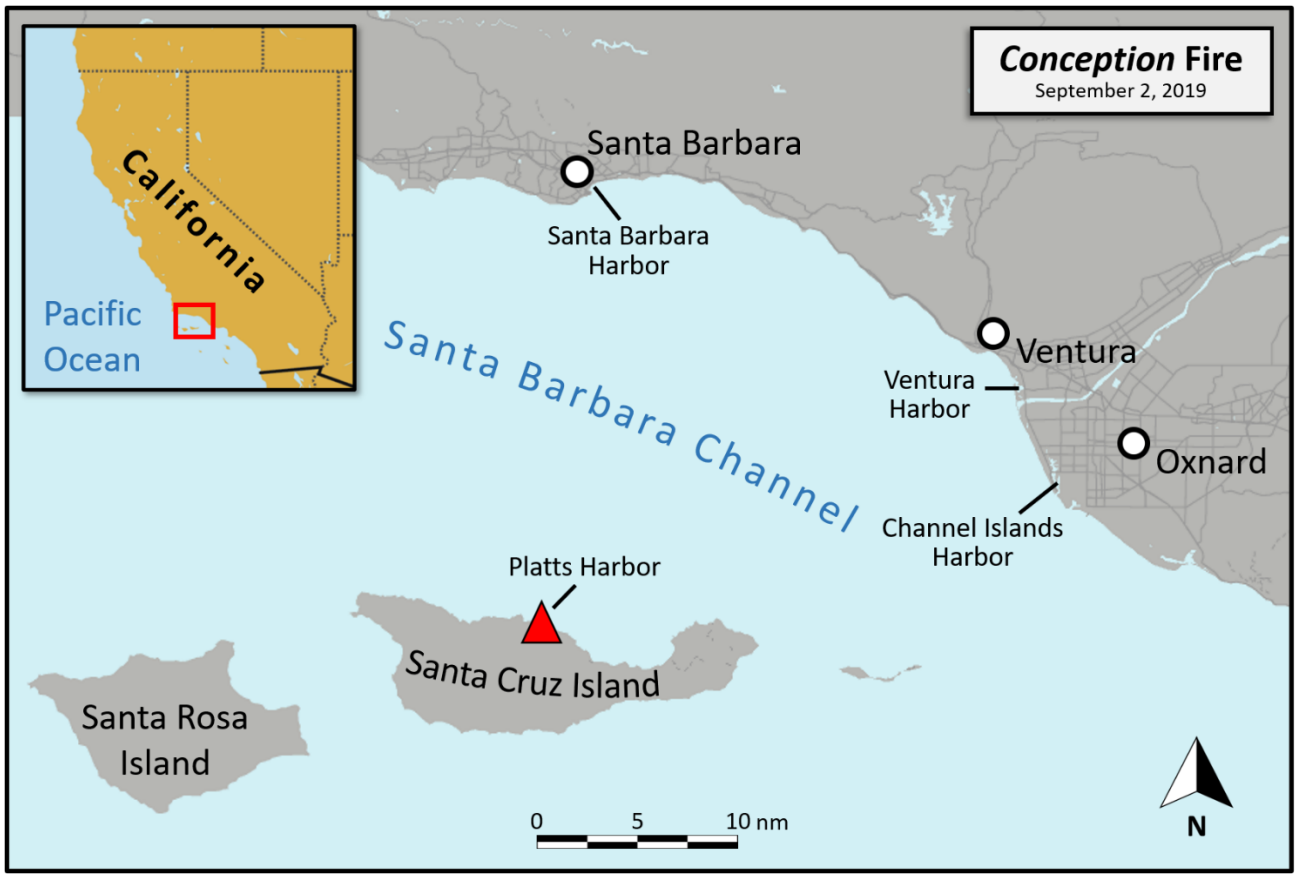

Figure 2. Accident location, as indicated by the red triangle. (Background source: Google Maps)

4 DETAILS OF THE INVESTIGATION

4.1 Vessel Operator and Owner

The *Conception* and two other similar dive boats, the *Truth* and the *Vision*, were operated by Truth Aquatics, Inc., a small company based in Santa Barbara, California. 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 6 crewmembers assigned to each vessel, Truth Aquatics employed a shore staff of about 10 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 US 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 owner was a member of the Sportfishing Association of California, an industry advocacy and advisory group.[1]

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 LA/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."

4.2 Vessel Charterer

For the accident voyage, the *Conception* was 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 over the 2019 Labor Day weekend. Worldwide Diving Adventures had been in business for about 50 years, and the organizer and leader of the chartered trip was one of the company owners. 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.

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[1] According to the organizations 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." www.californiasportfishing.org/about, accessed on April 28, 2020.

4.3 **The *Conception***

The 75-foot-long *Conception* was constructed in 1981 by Seaway Boats, Inc, in Long Beach, California. Like the other boats in the Truth Aquatics fleet, it was purpose-built to take recreational divers on one-day and overnight trips to dive sites around the Channel Islands off the coast of Southern California. The *Conception* was constructed of fiberglass laid over plywood and had three decks.

On the main deck was the salon with food service counters centerline and fixed dining tables on either side.[2] 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. Forward of the eating area was a galley with a refrigerator, a two-burner stove, an oven, and a griddle. All galley appliances were electric. On the forward starboard side of the salon, two sets of stairways led down below to the shower room (forward) and the bunkroom (aft). Doors at the aft end of the salon opened to the large open aft deck. According to the owner, the doors were kept open when passengers were on board. There were no other doors to the exterior from the salon. On either side of the salon were three sets of windows that could be opened by sliding the forward half of the window aft. On the port forward and center starboard windows, the owner had affixed "emergency exit window" labels to the sliding section of the window. These markings were not required by Coast Guard regulations. On the forward bulkhead of the salon in the galley area, three windows faced toward the bow of the vessel. The center window was hinged at the top and could be opened by pushing at the bottom. It was held open by brackets on either side of the window (it was not a designated emergency exit). When closed, the window was secured from the inside by threaded knobs. The forward bulkhead windows on either side of the center window were not designed to be opened.

Three small restrooms, each with a single toilet and a small sink, were located just aft of the salon. Two of the restrooms were accessed via doors on either side of the salon doors. The third restroom was accessed from the exterior via a sliding door at the bottom of the stairway leading to the upper deck. Exterior walkways on either side of the salon and the restrooms extended from the bow to the aft open deck. Fire hose stations were located on both port and starboard walkways.

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). An overhead rack on the aft deck was used to store kayaks and other watercraft. On the stern of the vessel, a large swim platform accessible by stairs from the open deck could be 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.

[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.

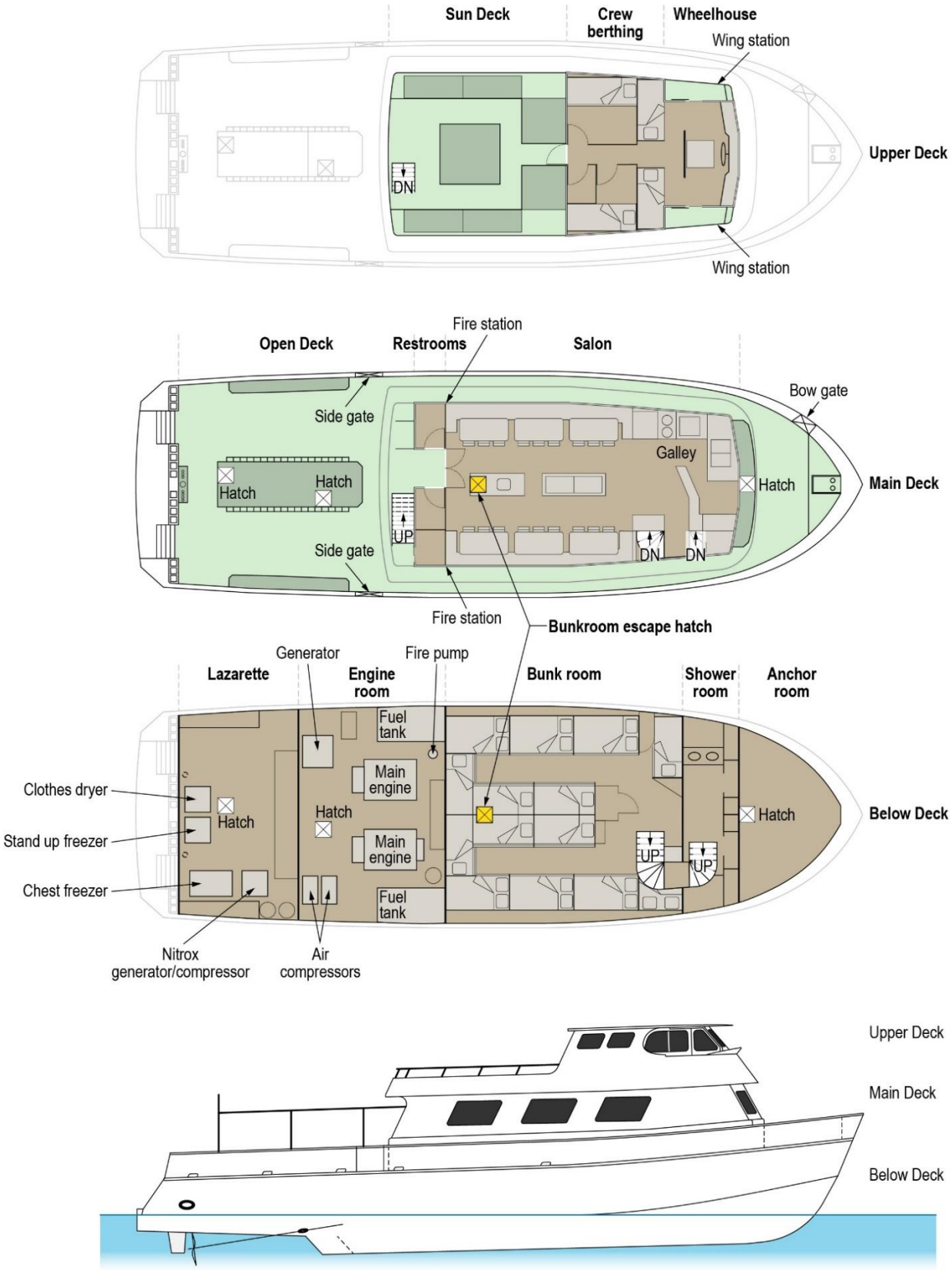

Figure 3. Conception general arrangements.

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Below the main deck, the vessel was divided into four compartments. The forwardmost space was an anchor chain locker that was accessible via a small hatch on the forward weather deck. The shower room was aft of the chain locker, followed by the bunkroom. The bunkroom contained 33 bunks, arranged around two aisles with bunks on either side of each aisle. Thirteen bunks were double bunks—allowing two persons to sleep in the same space—stacked two-high and located on the outside of the aisles. The remaining bunks were single bunks, stacked three-high. The maximum occupancy of the bunkroom was 46 persons (45 passengers and 1 crewmember).

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 removeable wooden panel that was about 22-inches-by-22-inches in size, was located in the overhead between the aftmost centerline bunks.[3] 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 rear of the salon, and thus both escape routes from the bunkroom exited into the salon. 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.

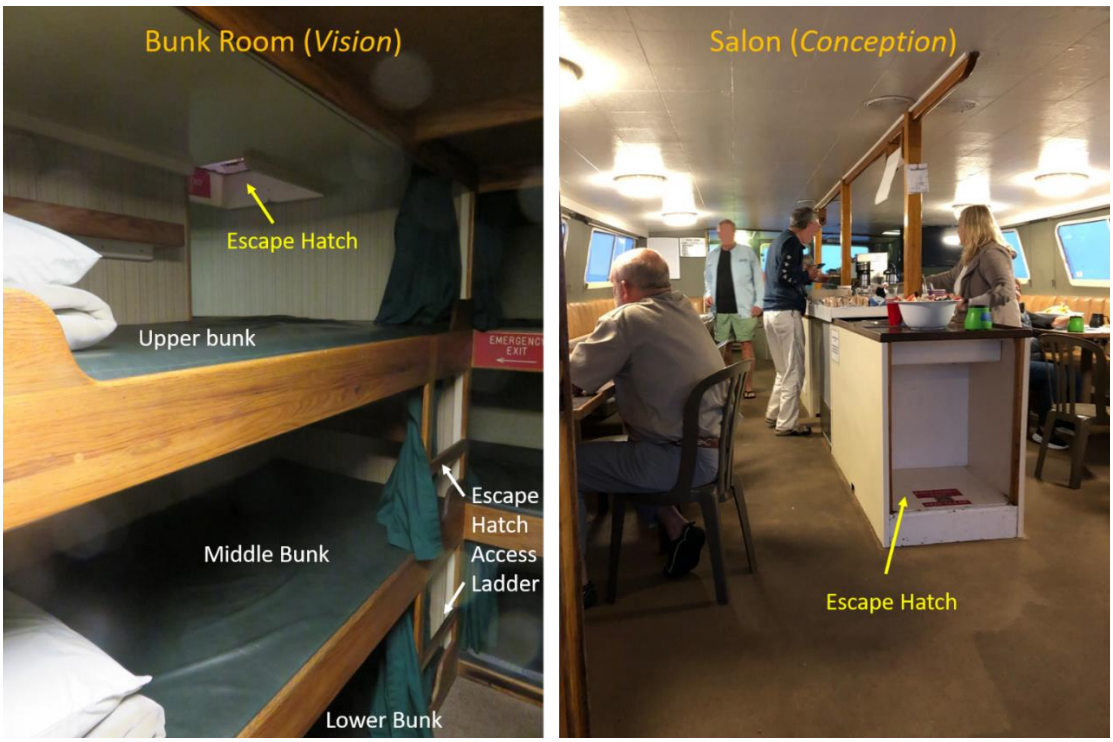

Figure 4. Photo left is the escape hatch, viewed from the bunkroom, on the *Vision*, a Truth Aquatics dive vessel with arrangements nearly the same as the *Conception*. (Source: NTSB) Photo right is the

[3] The measurements for the escape hatch are from the similar vessel *Vision*, which was built from the design of the *Conception*. There was no difference in the design of the escape hatch between both vessels.

escape hatch, viewed from aft in the salon, on the *Conception*. (Source: J. Palmer)

A watertight bulkhead divided the bunkroom from the engine room. The engine room contained two Detroit Diesel 8V92 550 hp main diesel engines, which drove two shafts providing propulsion via fixed-pitch propellers. A single Northern Lights MP55C 55kW generator driven by a John Deere diesel engine, located aft of the port main propulsion engine, provided electrical power for the vessel. Fuel tanks that supplied the engines and generator were located forward in the space, outboard of each of the main propulsion engines. Two air compressors used for filling scuba diving tanks were mounted aft of the starboard main propulsion engine.

A fire pump, powered by an electric motor, was installed in the engine room and, when on line, provided firefighting water to hoses at two stations located on the main deck aft on the port and starboard exterior bulkheads of the salon. The fire pump could also be aligned to pump out the bilge. According to the first deckhand on the *Conception*, the fire pump was only aligned in this way when needed to empty the bilge and was realigned to the fire stations at the completion of bilge pumping. The fire pump system was in addition to a dedicated bilge pump, located in the engine room and driven by the main engine. The fire pump could be started locally in the engine room or remotely at the port fire hose station.

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. The generator produced nitrox on demand and did not store the compressed gas within the system. (Compressed air and nitrox were only stored in scuba tanks brought on board by passengers and secured in the main deck racks.) In addition to the mechanical equipment, wet suits were dried and stored in the lazarette.

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, GPS receivers, an electronic charting system, and a watch alarm system.[4] 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. On either side of the passageway were two small crew staterooms; the port side 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 lifefloats. A single staircase on the aft starboard side of the sun deck provided access between the main deck and the sun deck.

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 galleyhands. During overnight voyages, the second captain and first deckhand slept in the wheelhouse bunks, the galleyhands slept in the two-bunk stateroom, and the captain slept

[4] Watch alarm systems are designed to ensure that bridge crew remain awake and alert while on watch. A system clock counts down a designated amount of time, and the watchstander must reset the system prior to the end of each count down. If the system is not reset, a loud alarm sounds.

in the single-bunk stateroom. The second deckhand slept below in the passenger bunkroom.

4.4 Accident Events

The accident voyage was scheduled to get under way 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. Per the Truth Aquatics' website and the company's *General Information Handbook*, passengers were instructed to sign their name to a posted blank manifest upon boarding, store their gear, and then proceed to their bunks.[5] A laminated "welcome aboard" briefing card was available to the passengers in the salon area and provided information such as meal times and the rules and considerations for the use of the bunkroom, shower room, drying room (lazarette) and kayak rack. It also described the location and procedures for issuing lifejackets and deploying lifefloats and instructed passengers to "review the safety card located in each bunk for proper adjustment of life jackets."

The second captain was the first crewmember to arrive at the *Conception*, boarding sometime between 2200 and 2300. The first and second galleyhands were next to arrive, between 2300 and midnight. The second captain and galleyhands each told investigators that, after boarding, they went to their bunks 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 embarked about 10 minutes later. 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 recorded data from the vessel's automatic identification system (AIS), the *Conception* was under way at 0404 outbound from Santa Barbara Harbor.[6] 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 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 by the crew.

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[5] According to crewmembers, passenger bunks were generally assigned by the charterer.

[6] *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.

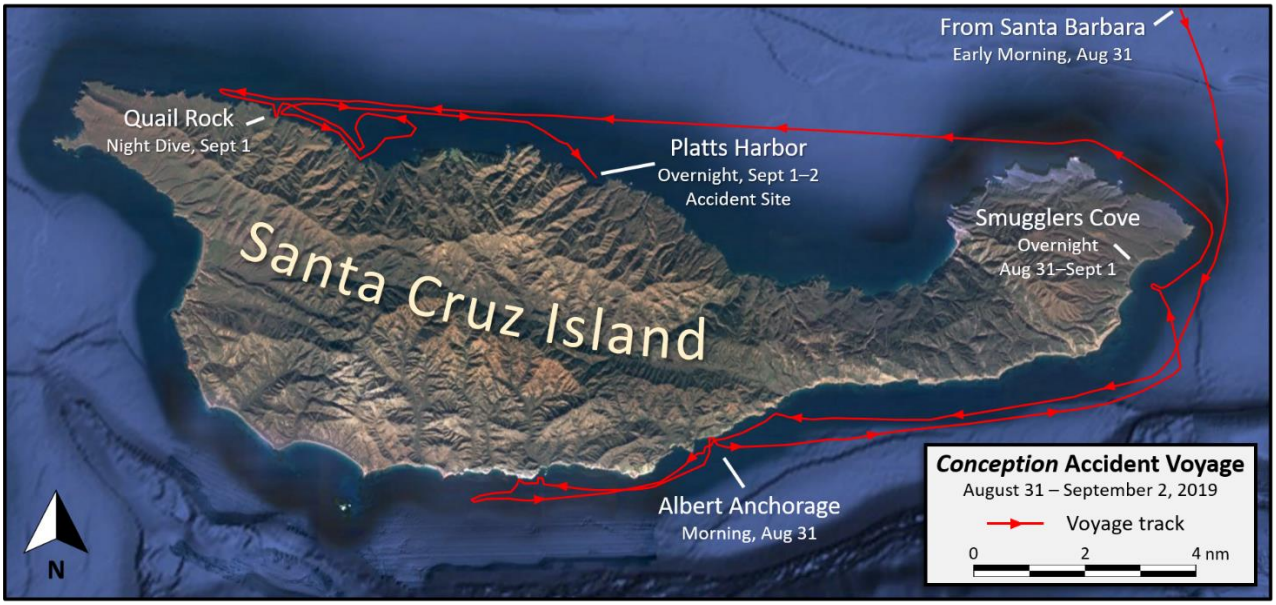

Figure 5. *Conception* accident voyage reconstructed from AIS data, with selected diving and anchoring sites at Santa Cruz Island. (Background source: Google Earth Pro)

The safety brief normally included information on the lifejackets and other lifesaving equipment, escape routes from the 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 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 first deckhand, provided "an abridged version" of the dive safety section of the brief.

Over the next 2 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 overnight anchored at Smugglers Cove on the eastern side of the island.

Between 2030 and 2130 on Sunday, September 1, 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 galleyhand turned off 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 energized 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, items such as underwater flashlights, cameras, and photo flashes/strobes that they used during the dive were stowed on the two aft tables in the salon. The second captain recalled that, because the devices had just come out of the water, they were wet when they were set on the tables. Crewmembers stated that some of these electronics, along with cellular phones and tablets, were plugged in to recharge via outlets located between the bench seat padding and on the aft bulkhead. The first deckhand said that it was not uncommon to have batteries charging next to camera equipment that was still drying after a dive. Crewmembers remembered that, on the accident voyage, at least one passenger-owned power strip was being used to recharge the electronics.

After the night dive, the *Conception* relocated to Platts Harbor, a natural protected anchorage to the east of Quail Rock, to anchor for the night. The *Conception* second captain remembered seeing a large sportfishing boat (later identified as the *Grape Escape*) in the anchorage when the dive boat arrived about 2300. After setting the anchor, the first deckhand rigged a "squid light." The squid light was a large light affixed to a 4-foot pole that hung out over the starboard side of the vessel shining down into the water, attracting sea life for passengers to observe. The electrical cable from the light was plugged into a socket on the exterior bulkhead of the salon. According to the second captain, the crew then conducted a walkthrough of the main deck to check for trip hazards and to stow loose gear. Sometime before midnight, each of the crewmembers went to bed. Before going to sleep, the first galleyhand stated that he plugged in his cell phone to recharge and "saw sparks" at the receptacle. The first deckhand stated that he and the second deckhand were the last to go to sleep and that a few passengers were still awake when they left the salon to head to their bunks. Crewmembers reported that the salon lights remained on through the night, as was the normal practice during voyages.

According to the second galleyhand, he woke up about 0130 on Monday. Although he was not required to work until 0600, he stated that when he awoke in the middle of the night he would often go down to the galley to wash any used coffee cups and 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. When he finished cleaning up, the second galleyhand emptied the trash cans in each restroom into a large trash can under the exterior stairs leading up to the sun deck. He stated that the large trash can was nearly full because he had to use one of the smaller trash cans to push the trash down. After gathering and dumping the trash, he used the restroom, went to his bunk, and laid down to go back to sleep. He said that as he came out of the restroom, he looked up at a wall clock and noted that it was 0235.

Sometime later after returning to his bunk, the second galleyhand was awoken by the sound of what he thought was a plastic chair sliding on the salon deck. He stated that "I heard that, and it 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, between 5 and 15 minutes later by his estimation, he heard a voice yell, "ahhh!" He told investigators that "it was definitely a human voice." The second galleyhand got out of his bunk to go check on the person and, looking out through the aft door of the crew stateroom area, saw a yellow glow emanating from below the aft starboard side of the sun deck. Realizing what he was seeing, the second galleyhand turned around and yelled "fire! fire!" to wake up the other crewmembers sleeping on the upper deck. Shortly thereafter, he saw the captain come out of his stateroom.

The first galleyhand told investigators that, while still in a sleep-like state, he had heard "a pop, and then a crackle downstairs." He then heard the second galleyhand jump down from his bunk, and shortly thereafter yell "fire!"

After warning the crew, the second galleyhand ran to the staircase at the aft end of the sun deck to attempt to get down to the main deck. He told investigators that when he reached the staircase and looked down, the restroom below the staircase was on fire, and flames blocked the way down. He returned to the wheelhouse, 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 galleyhand stated that he ran back to the aft open deck, intending to enter the salon through the rear doors to retrieve fire extinguishers. However, he could not get into the salon because the entire space was on fire. He told investigators that he saw the escape hatch engulfed in flames, and the fiberglass on the ceiling was melting and dripping down. He said that he ran aft toward the lazarette hatch, but finding nothing that he could do, he turned around again.

When they were awakened by the second galleyhand, the second captain and first deckhand had both preceded 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 galleyhand, who had told them that the staircase was blocked. Returning to the wheelhouse, they 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 walkway was blocked by smoke and flames billowing out of the salon windows. He proceeded forward and opened the bow gate on the port side, reasoning that passengers could more easily evacuate through the gate.

The first deckhand had also exited the wheelhouse via the port wing station door, but he recalled that, before leaving the wheelhouse, he heard the sound of an alarm that was “really quiet, really distant.” He thought the alarm was coming from the dashboard in the wheelhouse, but he said that it was “barely a little chirp.”

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

After the first deckhand had lowered himself down to the main deck, he looked aft and saw that the port exterior walkway 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. The deckhand, aided by the second galleyhand, 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 6. 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 LA/Long Beach watchstanders responded to the distress call, the captain transmitted, "39 POB. I can't breathe. 39 POB. Platts."[7] The smoke filling the wheelhouse then forced the captain out of the space, and he jumped into the water from the starboard side wing station. None of the crewmembers who were interviewed reported hearing any public address system announcement or warning to the passengers. The second captain stated, "I don't think that there was time. I don't think [the captain] was even able to finish his distress call before having to exit the wheelhouse." The second galleyhand recalled that when the captain came to the surface of the water, he said "Oh my God, all those people."

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. The first deckhand told investigators that there was no smoke in the space at the time. He then checked the port and starboard exterior walkways, and both were blocked by smoke and flames.

[7] *POB* is an abbreviation for persons on board.

Realizing that there was little they could do from the bow, the second galleyhand and the first deckhand decided to jump into the water. The second galleyhand encouraged the first galleyhand, who was laying on the deck on the bow, to jump as well. The first galleyhand was in a great deal of pain due to his broken leg, but he eventually entered the water through the port bow gate. In the water, the first and second galleyhand swam away from the vessel, while the first deckhand swam toward the stern. None of the crew were able to acquire or don lifejackets or obtain other lifesaving devices before entering the water.

After finding that the captain was unharmed, the second captain had swum to the stern and reboarded the *Conception* via the swim platform, which was in the raised position with the skiff stowed on it. He proceeded up onto the main deck toward the salon, where he found that the entire salon and upper deck were consumed by fire. He then opened the hatch to the engine room but was blocked from entering by black smoke (he told investigators that 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*. As he proceeded aft, he noted that the lights were 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 inflatable boat.

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 aft deck of the *Conception* 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.[8] Like the second captain, he checked the engine room but was prevented from entering due to smoke. (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 crew got the engine on the skiff running, they drove to where the galleyhands were located and helped both into the boat. The first deckhand then took the controls and drove the skiff over to the anchored sportfishing vessel *Grape Escape* to ask for help. 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. One of the owners then took the captain and second captain up to the bridge to make radio calls to the Coast Guard, while the other owner assisted the remaining crewmembers.

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." The owner and the *Conception* captain then provided information about the emergency, the location of the vessel, and the missing passengers and crewmember. Based on the initial call from the *Conception* captain 15 minutes earlier, the Coast Guard had begun alerting and dispatching nearby response units along the California coast

[8] The *Conception* was not equipped with, nor was it required to be equipped with, with any personal protective firefighting equipment or breathing apparatuses.

about the emergency, although the nature of the emergency was not initially clear. With the calls from the *Grape Escape*, the responders were now aware that the *Conception* was on fire.

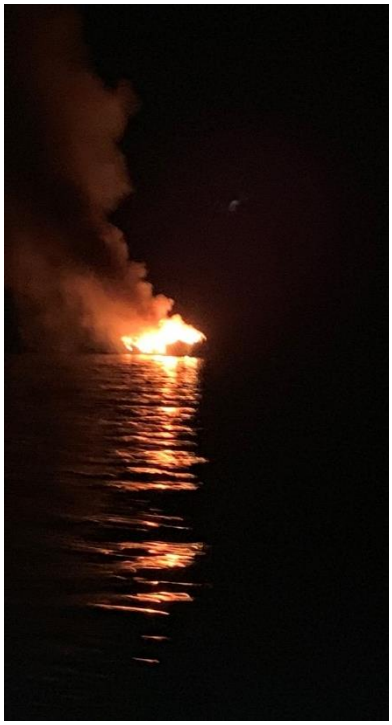

Figure 7. Cell phone photo of *Conception* on fire, taken from sportfisher *Grape Escape*. (Source: S. Hansen)

The second captain, who had returned to the main deck of the *Grape Escape*, along with the first deckhand and second galleyhand, assisted the injured first galleyhand onto the sportfisher. The second captain and first deckhand then reboarded the skiff to go search for survivors, while the second galleyhand remained on the *Grape Escape* with the first galleyhand. According to the second captain, the crew on the skiff conducted an initial search, returned to the *Grape Escape* to get handheld radios, then recommenced the search. The second captain stated that while the skiff circled the burning *Conception*, he and the first deckhand heard several explosions. They also found the squid light, which appeared to be intact, floating in the water (when the squid light was recovered after the accident, the housing and bulb were found intact). The crew did not locate any survivors, so they returned to the *Grape Escape*.

The *Conception* captain and *Grape Escape* owner had continued to communicate with Coast Guard Sector LA/Long Beach, providing weather and more accurate location information. At 0417, Sector LA/Long Beach watchstanders instructed them to send the skiff out again to search for survivors. Accordingly, the second captain and first deckhand reboarded the skiff and proceeded to search. The second captain told investigators that they searched around the *Conception* and also around the rocks surrounding Platts Harbor, finding no one.

As the crew in the skiff was conducting their search, Coast Guard helicopters and boats began arriving on scene. At 0438, a Ventura County Fire Department paramedic and engineer who were aboard a Coast Guard boat boarded the *Grape Escape* to attend to the injured first galleyhand. After assessing the injury, the firefighters recommended a medical evacuation. However, due to high obstructions and entanglement hazards on the *Grape Escape*, evacuation via helicopter was deemed unsafe. Therefore, the *Grape Escape* was instructed to transport the crew to Channel Islands Harbor in Ventura. The skiff returned to the *Grape Escape*, the second captain and first deckhand boarded the sportfisher, and the *Grape Escape* proceeded to Ventura. The captain remained aboard a Coast Guard vessel at the accident site to assist responders. (For more information about the emergency response to this accident, please see the Survival Factors Group Chairman's Factual Report.)

4.5 *Conception* Crew

4.5.1 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 with the company. Although the company did not complete any type of employee evaluations, the owner told investigators he had never had any concerns with the captain's performance.

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 designated periods when transiting at night, or for short periods during the day for breaks.

4.5.2 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 maneuvering the vessel.

4.5.3 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 Monterrey 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.

4.5.4 Second Deckhand

The 26-year-old second deckhand 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 galleyhand 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 an advanced open water diver certification.

4.5.5 First Galleyhand

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

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

4.5.6 Second Galleyhand

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

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

4.6 Toxicology

Truth Aquatics had a workplace pre-employment and periodic drug and alcohol testing program in place as required by Title 46 *Code of Federal Regulations* (CFR) part 16 and Title 49 CFR part 40. Per regulations, if an individual failed a drug test under the program, they could not be reemployed aboard a vessel until a medical review officer determined that that the individual was drug-free and the risk of subsequent use of dangerous drugs by that person was sufficiently low to justify his or her return to work. 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.

Just after 0800 on the accident date, upon the arrival ashore at Channel Island Harbor, the second captain, first deckhand, and the second galleyhand were administered blood alcohol content

(BAC) tests. The captain was tested when he arrived at the harbor about 45 minutes later. All tests results were 0.0% BAC. The first galleyhand 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. The first galleyhand 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 second galleyhand tested negative-dilute for tested drugs.[9] The remaining survivors tested negative for any tested drugs.

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

4.7 Regulatory Oversight

4.7.1 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 less passengers or have overnight accommodations for 49 or less 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 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 and arrangements, 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 subject to portions of both the pre- and post-1996 regulations. In this report, "New Subchapter T" and "Old Subchapter T" will be used to differentiate between the two sets of regulations as they applied to the accident vessel.

4.7.2 Certification and Inspections

The *Conception* was required to have a valid Certificate of Inspection (COI) issued by the Coast Guard. As stated in the regulations, 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 Officer in Charge, Marine

[9] 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.

Inspection (OCMI)]."

After a vessel is built, a COI is issued by the Coast Guard upon the acceptance of vessel plans, manuals, and stability calculations and the successful completion of an initial inspection. A COI for vessels traveling on domestic routes is valid for 5 years. Prior to renewal at the end of 5 years, the vessel must be reinspected 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.

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 deficiencies are found or a major change to the vessel has occurred, the inspector will conduct an inspection more detailed in scope. 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. Coast Guard inspectors also have the authority to issue civil penalties to vessel owners and operators for non-compliance with regulations or the vessel's COI.

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. During the hull examination, "all accessible parts of the vessel's underwater body and all through hull fittings, including the hull plating and planking, appendages, propellers, shafts, bearings, rudders, sea chests, sea valves, and sea strainers shall be made available for examination. Sea chests, sea valves, and sea strainers must be opened for examination." On wood vessels, the inspector may require fasteners on the hull to be pulled for inspection. An internal structure examination "consists of a complete examination of the vessel's main strength members, including the major internal framing, the hull plating and planking, voids, and ballast, cargo, and fuel oil tanks. Where the internal framing, plating, or planking of the vessel is concealed, sections of the lining, ceiling, or insulation may be removed or the parts otherwise probed or exposed so that the inspector may be satisfied as to the condition of the hull structure."

To aid in the conduct of these inspections, the Coast Guard has 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 last updated in 2011. Coast Guard sector commands and marine safety detachments (MSD) may also have supplemental or compressed checklists for inspections. MSD Santa Barbara, a sub-unit of Sector LA/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.

4.7.3 *Conception* Inspection History

The *Conception* had a valid COI issued on November 19, 2014, and signed by the Coast Guard Sector LA/Long Beach Chief of Prevention, "by direction" of the Officer in Charge, Marine

Inspections. Per the COI, the vessel was required to be manned by a credentialed master and mate, as well as two uncredentialed deckhands.[10] The vessel could carry up to 99 passengers but was limited to 46 passengers for overnight accommodations. It was permitted to operate in the Pacific Ocean, not on an international voyage, and not more than 100 miles from mainland shore, between 31°45' north latitude (off northern Baja, Mexico) and 35°47.5' north latitude (the San Luis Obispo/Monterey, California county line, extended to sea). The COI required 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 bunks are occupied."

MSD Santa Barbara conducted the 5-year COI renewal inspections, annual compliance inspections, and biannual hull and 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.

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 and hull examination conducted in February 2019.

The 2014 inspection for certification and subsequent annual inspections were conducted by the same MSD-Santa Barbara inspector. For the inspection for certification and 2016 annual inspections, he was joined by the second MSD-Santa Barbara inspector. For the annual inspections in 2017, 2018, and 2019, he conducted the inspections alone. The hull and structural examinations in 2015 and 2019 were also conducted by the same inspector, the former with the assistance of the second inspector, and the latter without. The 2017 hull examination was conducted by the second inspector alone.

When NTSB investigators spoke with Coast Guard inspectors at the MSD, sector, and headquarters level, the NTSB staff was told that, at larger commands with larger staffs such as a sector, inspections of small passenger vessels were normally conducted by at least two officers, and it was uncommon for the same officer to conduct an inspection on a single vessel several years in a row. However, at smaller commands such as an MSD, it was common for the same officer to conduct an inspection alone and to conduct multiple successive inspections on the same vessel due to the small number of inspectors assigned to the area. There is no Coast Guard policy governing how many inspectors are required to conduct an inspection or whether successive inspections can be conducted by the same inspector.

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

4.8 Watchstanding

4.8.1 Navigation Watches

Per New Subchapter T regulations, "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 Title 46 of the *Code of Federal Regulations*.) 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 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 Subchapter T to maintain a navigation watch while a vessel is at anchor.

4.8.2 Roving Patrols

Per Title 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 the New Subchapter T regulations (Section 185.410), the Coast Guard requires a roving watchman (or watchmen) to "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 previously noted, a related provision requiring a roving patrol when passengers were in their bunks was included in the "Route Permitted And Conditions of Operation" section of the *Conception*'s certificate of inspection. 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 watch, both under way and not under way.

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.

When the vessel was not under way, whether moored in harbor in Santa Barbara or anchored around the Channel Islands, there was no designated watch or 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 at anchor, no watch was set, 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 watch requirement. He said 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 watch requirement, a former captain of the *Truth* told Los Angeles Times reporters, "It's a regulation, but it wasn't really followed."[11]

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 law, regulation, and COIs requiring a night watchman or roving patrol on small passenger vessels. 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 include a line item for verifying that a roving watch is 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.

4.9 Crew Training for Fire Emergencies

New Subchapter T regulations 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

[11] 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.

overboard. Training of crewmembers must be logged or otherwise recorded.

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, 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.

Conception crewmembers stated that, with the exception of first aid and 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.

New Subchapter T regulations also require the master of a small passenger vessel to "conduct sufficient fire drills to make sure that each crew member is familiar with his or her duties." The regulations do not specify the frequency that the drills must conducted. The regulations state that the drills shall include a muster of the passengers, reporting of the crew to assigned stations and demonstration of assigned duties, and instruction in the use of fire alarms, extinguishers, and any other firefighting equipment on board. The drills must be logged and include the date of the drill and a general description of the drill scenario or training topics.

The second captain, first deckhand, and second galleyhand 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 firehose 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 galleyhand 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.

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 completely 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.

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). None have been cited during this period for failure to conduct fire drills.

4.10 Coast Guard Navigation and Vessel Inspection Circular No. 1-91

In February 1991, the Coast Guard issued Navigation and Vessel Inspection Circular No. 1-91 (NVIC 1-91), entitled "Recommended Qualifications for Small Passenger Vessel Deckhands." The circular provided the marine industry with guidelines for the recommended qualifications and training topics for deckhands engaged or employed on small passenger vessels to ensure the safe operation of the vessels. It provided recommendations for basic physical requirements for deckhands, as well as emergency conditions for which a deckhand should be familiar: man overboard, fire, abandon ship, foul weather, medical emergency, and collision. Further, it recommended seamanship, engineering, and passenger safety/control duties for which a deckhand should be familiar. NVIC 1-91 was updated in 2003 to add specific guidelines for deckhands on high speed small passenger vessels, and this version is still in effect today. The guidelines in the NVIC are not mandatory, but rather, they are intended to "allow the industry to undertake a voluntary training program which will provide an increased level of knowledge and skill for their crew members."

The NVIC recommended that Coast Guard inspectors use the guidance "during inspections for certification and reinspections, when evaluating training programs, and during drills conducted to ensure crew competency." The CG-840 TI inspection book included a checklist item to "discuss recommended Deckhand qualifications," but this was only required for high speed small passenger vessels. The owner of Truth Aquatics told investigators that he was not familiar with NVIC 1-91, but he stated that captains of the company vessels normally oversaw inspections on their vessels with the Coast Guard and could not comment on whether the document had been reviewed with the crews.

4.11 Passenger Safety Briefing

Per New Subchapter T, the master of a small passenger vessel must ensure that, "before getting underway on a voyage or as soon as practicable thereafter," public announcements are made to provide passengers with a safety orientation. The announcements must include:

(1) The location of emergency exits, survival craft embarkation areas, and ring life buoys;

(2) The stowage location(s) of life jackets;

(3) Either:

(i) The proper method of donning and adjusting life jackets of the type(s) carried on the vessel including a demonstration of the proper donning of a lifejacket, or

(ii) That passengers may contact a crew member for a demonstration as appropriate, prior to beginning an oceans or coastwise voyage;

(4) The location of the instruction placards for life jackets and other lifesaving devices;

(5) That all passengers will be required to don life jackets when possible hazardous conditions exist, as directed by the master; and

(6) If the vessel is operating with reduced manning or equipment requirements.

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 life jackets. During interviews with investigators, current and former 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*.

As an alternative to the safety orientation announcements, New Subchapter T permits the use of a card or pamphlet, delivered to each passenger before getting under way, with the above listed information on it. If using the pamphlet, an abbreviated announcement must be made prior to getting under way that consists of a statement that passengers are to follow the instructions of the crew in an emergency, the location of life jackets; and that further information, including instructions for the donning of life jackets, the location of other emergency equipment, and emergency evacuation procedures are provided on the card or pamphlet.

As previously noted, a "Welcome Aboard" card was available in the *Conception* salon containing general information as well as the location of lifesaving equipment. Additionally, placards in each bunk provided lifejacket donning instructions.

New Subchapter T 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." 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.

4.12 Crew and Passenger List

New Subchapter T regulations 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.

4.13 Safety Management Systems and Company Loss Control Program

The International Maritime Organization (IMO) developed international safety management standards in the 1980s following serious marine casualties caused by human error or management failure. This led to the development of 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."[12] The IMO adopted the ISM Code in 1993. In 1994, IMO members, including the United States, adopted the ISM Code as Chapter IX of the *International Convention for the Safety of Life at Sea* (SOLAS).[13] In 1998, the ISM Code was made mandatory for vessels on international voyages, such as passenger ships, high-speed craft, tankers, and cargo carrier ships. For other cargo ships on international voyage, the ISM Code took effect in July 2002.

The ISM Code, along with Title 46 *US Code* Section 3203 and Title 33 CFR part 96 that implement the code for US and other applicable vessels, requires that vessel operators implement a safety management system (SMS). An 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;

(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.

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 (in which the Coast Guard operates) to "prescribe regulations

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[12]IMO, 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.

[13] The SOLAS Convention is generally regarded as the most important of all international treaties concerning the safety of merchant ships. The main objective of the convention is to specify minimum standards for the construction, equipment, and operation of ships, compatible with their safety. Flag states are responsible for ensuring that ships under their flag comply with its requirements. The first version of the SOLAS Convention was adopted in 1914 in response to the Titanic disaster. The current version in force is the 1974 Convention, as amended on numerous occasions. Source: International Maritime Organization (IMO), International Convention for the Safety of Life at Sea (SOLAS), 1974, http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Safety-of-Life-at-Sea-(SOLAS),-1974.aspx.

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, nor are the regulations currently under development.[14] Truth Aquatics did not have an SMS for its vessels, nor was it required to.

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. ("Loss control" is an insurance industry term for a program to manage risk and reduce losses.) 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 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 Sea Landing office and they will be made available to all employees.

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[14] Office of Management and Budget, Fall 2019 Unified Agenda of Regulatory and Deregulatory Action, Department of Homeland Security Agency Rule List, 2019, https://www.reginfo.gov/public/do/eAgendaMain.

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] (see 3A for Abandon Ship procedures).

The second captain, first galleyhand, and 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 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 stated that he was asked to read the *Loss Control Program* (as well as the other new employee documents) and review it with the crew when he got on board the vessel for the first time. 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 within before he got under way on the *Conception*. The first galleyhand said that he did not receive the new employment documents until just prior to the accident voyage, his fifth or sixth 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 galleyhand 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."