



THE CONCEPTION TRAGEDY

**SAFETY LESSONS
FROM THE SANTA
CRUZ ISLAND
DIVE-BOAT FIRE.**

BY _____

It was a quiet night aboard the 75-foot scuba-diving boat *Conception*, anchored on Labor Day weekend in 2019 off Platts Cove, Santa Cruz Island, some 21 nautical miles from Santa Barbara, California. The wind and swells were light, and after dinner, the 33 passengers tucked into their bunkroom after a long day of scuba diving in the clear waters that are like an aquarium filled with colorful fish, sea lions, seals, forests of kelp, and lobster. Four of the five crew also went to their bunks to prepare for the final day of diving on the three-day outing. A last crewmember finished tidying up in the galley, heading to his berth around 2:30 a.m.

PHOTO: COURTESY VENTURA COUNTY FIRE



The fire alarms on board were apparently not loud enough to alert the crew and passengers. A crewmember who went to check on a noise he heard below found the salon in flames.

THE HATCH
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Forty-five minutes later, 34 of those aboard were dead or dying.

Fire is one of the most feared disasters aboard any boat, especially because boats are surrounded by water, and the *Conception* tragedy is worth examining to understand its causes and effects, and to glean lessons for recreational boaters.

Conception was operating as a US Coast Guard-inspected commercial passenger vessel, and thus had different regulations than a pleasure boat. One of the first discoveries made by multiple investigative agencies, including the National Transportation Safety Board (NTSB) and Coast Guard, is that *Conception* breached Subchapter T of the Code of Federal Regulations by not having someone on watch throughout the night to sound the alarm in just such a situation, but this reg doesn't apply to recreational boats.

There are three parts to

understanding the *Conception* tragedy. First, what happened? Second, how did it happen? Third, what can we learn?

Like many other dive and fishing boats, often called headboats or party boats, that carry large groups of enthusiasts offshore on overnight or longer voyages, *Conception* had a bunkroom forward on the lowest deck. In it, bunks were stacked two- and three-high Pullman-style, each with a privacy curtain. In the bow were heads with showers, as well as curved stairs leading to the main deck salon and galley above.

These stairs exited next to the galley, and the rest of the salon was devoted to bench seating and tables for dining, playing cards or lounging, with an aft exit emerging out onto the after deck. Above the salon/galley on the sun deck was the pilothouse with bunks for crew. The after deck was open, with racks for dive tanks and gear.

WHAT HAPPENED?

All was normal as the divers had dinner in the salon after a night dive, with some staying up late to celebrate three birthdays before heading for their berths. The captain and most of the crew turned in as well, with one remaining to clean up in the galley until 2:30 a.m., when he also went to his berth.

At 3:14 a.m., just 45 minutes later, Coast Guard Long Beach received a mayday call from the captain, nearly overcome by smoke, saying *Conception* was on fire with 39 souls on board, and adding, "I can't breathe."

According to interviews with the crew, a crewmember in the pilothouse heard a noise and went to investigate, finding the salon of the dive boat in flames.

Because the stairs from the pilothouse and sun deck were on fire, the five crew had to jump to the main deck, with one breaking his leg in three places. Finding

the salon's aft passageway also on fire, two crew went forward on the side deck, hoping to reach the salon through a forward window, but they were driven overboard by smoke and fumes.

Two other crew and the captain swam to the stern, reboarded, and opened the engine-room hatch, finding no fire. They launched a dinghy, picked up the two crew in the water, and went to a 60-foot

through, and *Conception* began to drift toward the rocky shoreline. Because of its shallow draft, the TowBoatUS RIB was able to maneuver close and throw a grappling hook onto the bow. It pulled *Conception* off and held it in deeper water while the two fireboats continued to pump water onto the blaze. *Conception* eventually burned to the waterline, sinking in 60 to 65 feet of water.

Divers went down at daylight to assess the situation and, after waiting several days for wind and seas to subside, *Conception* was eventually raised onto a barge and sent to

boats "immaculate."

Conception was equipped with the mandatory fire-suppression system in the engine room, plus above-deck hoses, and the company had installed smoke detectors on board.

HOW DID IT HAPPEN?

Investigators are looking at two areas of concern for both recreational skippers and commercial operators. First, the method of escape needed for those in the bunkroom and, second, how the fire started.

Under consideration are the routes of escape for those in the bunkroom. There was a narrow



Hatteras sport-fisher, *Grape Escape*, anchored nearby. From there, the captain again called the Coast Guard while two crew returned to search for survivors.

The Coast Guard scrambled to send a chopper, an 87-foot cutter and other assets, but it was a Ventura County fireboat that arrived first, with five additional fire and rescue boats joining the scene, as well as a RIB from TowBoatUS Ventura. The fire was out of control at this point, with explosions presumably coming from scuba tanks ticking off.

The anchor line soon burned

a boatyard, where the NTSB and Coast Guard investigations are still continuing.

Built of plywood with a fiberglass overlay in 1981, *Conception* was operated by a dive company called Truth Aquatics and reportedly well-maintained. It had been in full compliance from two recent Coast Guard inspections, with no problems other than an expired fire extinguisher in 2017. Guests aboard previous trips called *Conception* and two other boats in the Truth Aquatics fleet among the best and safest dive boats around. One called their

stairway, wide enough for one person at a time, going from the bunkroom to the forward end of the salon next to the galley. But in this case, the galley area was already on fire.

As required by Coast Guard regulations, there was a second escape hatch in the ceiling of the bunkroom, but this was also useless because it exited into the burning salon above. In addition, it was above a berth, thus requiring passengers to climb to the top bunk, then push up the hatch and exit. The hatch was just 24 inches square, which

made it a squeeze, and there remains a question whether the passengers even knew of its existence. Coast Guard rules (from which *Conception* was exempt) require 32-inch hatches on newer vessels.

In the bunkroom, *Conception* had two home-style smoke detectors, like those found in any hardware store, but they were not linked together into a unified alarm system. The surviving crew in the pilothouse heard no smoke detector alarm.

LI-ION BATTERIES

This brings up the cause of the fire and, while the NTSB and Coast Guard don't expect an official report for at least a year, one intense area of focus has been li-ion batteries.

Li-ion, or lithium-ion, batteries are used to charge every manner of portable electronics, and have grown in popularity because they are lighter and offer greater power for devices with high power requirements.

The downside is that they create considerable heat while recharging, which can lead to fires. If not properly vented and protected, the heat from one charging li-ion battery can set off a chain reaction with other batteries. The electrolyte inside a li-ion battery is volatile and flammable, and a catastrophic failure, called a "thermal runaway," can drive the temperatures even higher. Tests show exploding batteries shooting off red-hot pieces in all directions.

Compounding that problem is that boats such as *Conception* were built before the modern world of digital cameras, cell phones, laptops, tablets and, in this case, dive gear that included underwater cameras, lights and scooters. Even the lowly vape cigarette uses a li-ion battery.

The original installers of the electric receptacles, in both number and placement, couldn't foresee the new

personal electronics boom, so circuitry might have been sadly undersize for the power needs, especially when used with multiplug strips. Even worse, a power strip overloaded with li-ion battery chargers and then tucked behind a couch can produce fatal results when burning plastics release cyanide, while flooring or polyvinyl-chloride seating upholstery emits deadly hydrogen chloride.

Just a year before, a sister boat of *Conception* had an incident where a crewmember saw a charging li-ion battery smoldering, and he tossed it overboard.

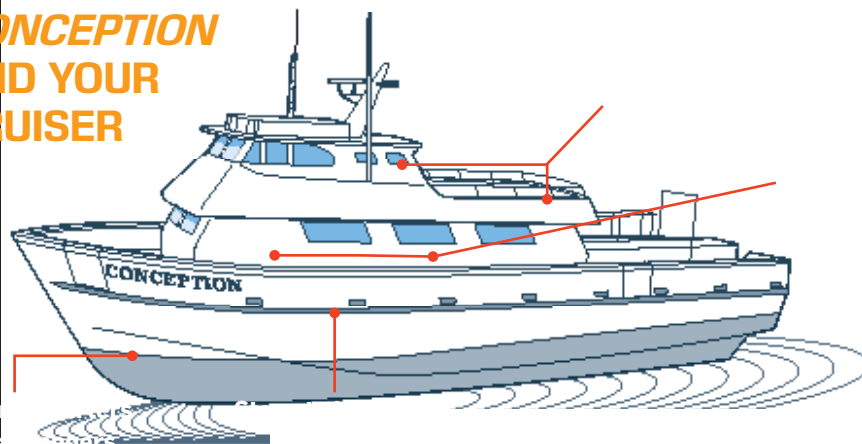
Such li-ion fires burn incredibly hot—up to 1,000 degrees F—resulting in the aforementioned chain reactions of nearby batteries. Because of four deaths and the loss of four aircraft, the Federal Aviation Administration has banned li-ion batteries from cargo holds because the crew can't monitor them. Li-ion batteries are allowed in carry-on luggage, where passengers and crew can see and smell smoke. Even then, the FAA has recorded 265 air or airport incidents involving li-ion batteries in cargo or baggage. In one case, headphones exploded on a plane. The Navy has severely restricted li-ion batteries, banning all vaping devices on its vessels after they set off numerous fires.

WHAT CAN WE LEARN? GETTING OUT: Just as airline crew are required to give a safety briefing before the plane takes off, there should be a captain's briefing before you leave the dock. Be sure to include placement of fire extinguishers, life jackets and the location of emergency exits.

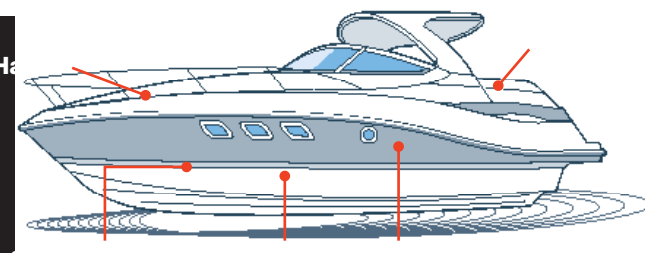
One question raised by investigators is whether the passengers had been properly briefed, or if the captain's briefing didn't mention the second escape hatch, even though it wouldn't have been useful in the

CONCEPTION AND YOUR CRUISER

Sleeping quarters for passengers



Hatch



Salon and berths (plus head) Galley Steps

CONSIDER HOW YOU WOULD ESCAPE AT NIGHT IF YOUR SALON WAS ON FIRE. WHAT IF THE ENGINE COMPARTMENT WAS ON FIRE? WHAT IF THE GALLEY WAS ON FIRE?

The crew first noticed the fire in the salon of *Conception*. Like many recreational boats, egress to the sleeping quarters and berths was through the salon and galley, which blocked the easiest path to escape.

Where are the sleeping quarters located on your recreational cruiser? Is there more than one way to exit in the event of an emergency? Is there a hatch to the bow deck?

burns, meaning they were overcome before they could escape.

On a pleasure boat, do your "what-ifs." Consider how you would escape at night if your salon was on fire. What if the engine compartment was on fire? What if the galley was on fire? Make sure everyone aboard is aware of alternative escape routes and how latches and hinges work.

POST A WATCH: This might be the biggest mistake made by the crew of *Conception*. We know they failed to have someone on a night watch, as required by federal regulations. No one will ever know, but had they adhered to the rule, it could well have averted the tragedy.

How does this apply to recreational boaters? As mentioned earlier, we're not required

by law to post a watch when overnighting. Yet there are situations like that of *Conception* in which rotating night-watch duty among crewmembers—so each gets some sleep—is a prudent safety step.

When at sea or on large bodies of water at night, many things can threaten safety. Anchors drag. Winds shift. Bilges flood. Other boats might not see you. And a fire might break out. A night watchman offers assurance that you can take action quickly and avoid catastrophes.

WATCH IT OR BOX IT: Li-ion batteries are known as a danger on airliners and, just eight days after *Conception* went down, the Coast Guard issued Marine Safety Information Bulletin 008-19, which says: "Reduce potential fire hazards and consider

limiting the unsupervised charging of lithium-ion batteries and extensive use of power strips and extension cords."

The key word is "unsupervised," which, in the case of *Conception*, seems to have proven deadly. Everyone aboard just plugged in multiple battery chargers and went to bed. If you absolutely must leave li-ion batteries charging overnight, consider getting one of the battery safety boxes now on the market, which isolate li-ion batteries and chargers in a fireproof box that contains heat and explosion.

In addition, make sure your 120-volt AC electrical system is prepared to handle the increased power requirements of device battery chargers, and try to eliminate both extension cords and power strips. Never leave li-ion battery chargers unsupervised, and ensure your electrical system meets ABYC standards and can handle the power demanded.

FIND YOUR WAY: An experienced skipper knows that many emergencies seem to happen in the dark of night, and the suggestion has been made that, aboard *Conception*, the passengers couldn't find light switches in the smoky darkness. You aren't going to install an exit sign like a theater, but an illuminated light switch could help your guests find a light to guide them through smoke or fumes. At the same time, your guests should have ready access to flashlights. Look for replacement illuminated light switches that run \$10 to \$20 at most hardware stores. Flashlights should be handy to every berth, and their location should be included in the skipper's briefing.

ADDING EXTINGUISHERS: Coast Guard regulations for recreational boats call for owners to have one B-1-type fire

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extinguisher aboard vessels 26 feet and under, and a minimum of two for boats between 26 and 40 feet. This is the minimum requirement. If you own a cabin boat and like to overnight at anchor or in a marina, think about adding more fire extinguishers and placing them in easily accessible locations in the berths and other key spaces belowdecks. Even if using an extinguisher isn't enough to put out a fire, it could hold the fire back long enough to escape.

ALARMING: While *Conception* apparently had smoke detectors in the bunk area, they weren't linked to any system. It was only by chance that one crewmember investigated a noise and discovered the fire, since the alarms weren't audible to the crew.

Consider a unified smoke and carbon-monoxide warning system, particularly in sleeping areas, that would sound the

alarm for everyone. Any electronics shop can also tie these into the horn on your vessel, thus alerting other boats on your dock of a fire.

EXTRA GEAR: We all know that storage is at a premium on board recreational boats, but consider adding extra safety items to your list. We've heard of people keeping fire blankets stowed in all berths that passengers can use to throw over a small fire or, in an extreme situation, wrap themselves in to avoid burns while trying to escape a fire.

The official report on the *Conception* tragedy probably won't be available for more than a year because the investigating authorities are still working to find definitive answers. But every recreational boater can learn from this tragedy about how to protect their family and guests aboard their own boat in the event of a fire.

