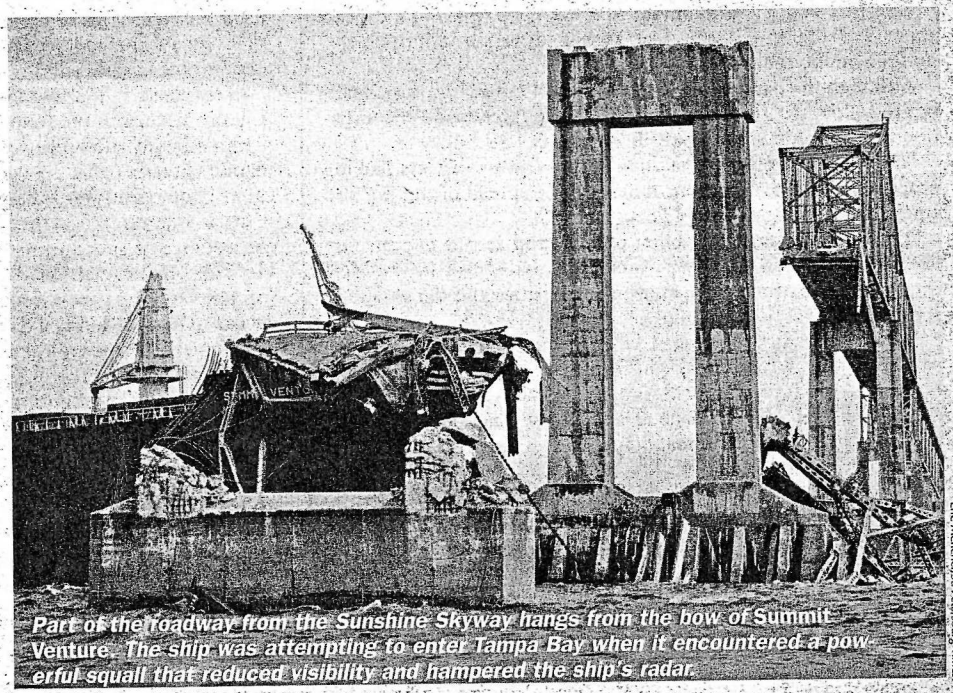
The Sunshine Skyway collapse, May 9, 1980



Eric Mencher/St. Petersburg Times

Part of the roadway from the Sunshine Skyway hangs from the bow of Summit Venture. The ship was attempting to enter Tampa Bay when it encountered a powerful squall that reduced visibility and hampered the ship's radar.

One of the most infamous ship-bridge collisions in the United States occurred on the morning of May 9, 1980, when the 606-foot, 35,000-dwt *Summit Venture* hit the Sunshine Skyway in St. Petersburg, Fla. Thirty-five people fell to their deaths from the collapsed span.

On the afternoon of May 4, *Summit Venture*, a bulk carrier owned by Hercules Carriers Inc., of Monrovia, Liberia, departed Houston in ballast to load phosphate rock in Tampa, Fla. Two days later, she anchored off the entrance to Tampa Bay, where she discharged a portion of her water ballast, giving her a draft of 21 feet aft, and 9 feet forward. At 0625 on May 9, the pilot, Capt. John E. Lerro, and observer pilot, Capt. Bruce Atkins, boarded the vessel near Egmont Channel Buoy No. 1, the start of Tampa Bay's 58-nm shipping channel. That morning there were severe thunderstorms scattered between Tarpon Springs, Fla., 40 miles to the north, and Venice, Fla., 45 miles south; but off the entrance to Tampa Bay the wind was blowing easily from the southwest at about 10 knots and visibility was about three nautical miles.

The approach to Tampa-St. Petersburg is via a series of well-marked channels that begin about 19 nm west of the Sunshine Skyway Bridge. The inbound heading for Egmont Channel is 093° T and runs between Egmont Key to the south and Mullet Key to the north. Just past the latter, the channel doglegs to the south, and ships run about 3.2 nm to the entrance of Mullet Key Channel on a course of 097° T. Mullet Key Channel runs about five nautical miles along a heading of 081° T before running into Cut "A" Channel that used to run under the twin spans of the Sunshine Skyway Bridge on a heading of 063° T, not quite perpendicular to the bridge.

When it opened in 1954, the bridge represented the fulfillment of a quarter-century of dreams deferred. The Bee Line Ferry had inaugurated car-carrying service across the mouth of Tampa Bay in 1924. Demand was so great that within five years there was talk of a bridge, which would cut 50 miles off the road trip around Tampa Bay between St. Petersburg and Bradenton, Fla. This idea was shelved during the Depression, to be briefly revived in 1939, when the legislature passed a bill authorizing a bridge-tunnel road. This plan had to be put aside during World War II. The post-war design called for a single bridge across the bay, and construction finally began in 1950.

Four years later, the Sunshine Skyway Bridge opened, carrying two-way traffic in two lanes. The Skyway itself was the cantilevered center span, which leapt the 864-foot-wide shipping channel in a single bound from pier 1N to pier 1S. (The piers were numbered sequentially running north and south away from the channel.) In response to increased demand, a second bridge dedicated to southbound traffic was opened just west of the original in 1971; the original bridge served northbound drivers only. In its entirety, the bridge was about 15 miles long, the majority of it being a causeway running just above the water and from which the road rose at a steep 5° angle to cross 150 feet above the shipping channel.

On the morning of May 9, 1980, Lerro brought *Summit Venture* into Egmont Channel at 0639. Passing through occasional rain squalls, the ship met the outbound MV *Goodsailor* and overtook the tug *Dixie Progress* and a barge. At a little past 0700, Lerro turned into Mullet Key Channel, keeping to the right-hand side of the channel. With the rain increasing in intensity, Lerro had the ship's captain station two lookouts and an anchor detail in the bow. At the same time, he picked up a radar reading of the outbound vessel *Pure Oil*, which was about equidistant from the bridge to the east.

At 0718, the rain thickened considerably and three minutes later Lerro reduced speed to about 9.5 knots. At this point, with the ship 0.2 nm from buoy 2A at the turn into Cut "A" Channel, the wind increased to 40 to 50 knots and shifted to just north of west. Rain reduced visibility to less

than 500 feet — the bow was not visible from the ship's bridge — and weather clutter led to a temporary loss of radar presentation. Lerro ordered the anchors readied for letting go, but the weather cleared slightly and the ship appeared to be in the channel. At 0728, a lookout reported a buoy ahead and to port. Although no one on the ship's bridge saw the buoy, Lerro took it to be buoy 2A, which marked the south side of Cut "A," and ordered a course change to 063° T and reduced speed to slow ahead.

At this critical juncture, Lerro was denied two pieces of information that may have been decisive. A few miles west, *Goodsailor*'s radar showed a squall moving east on a heading of 280° T. This passed over the ship with gusts of up to 70 knots but lasted only two or three minutes. No mention of this was made via radio, a point noted by the U.S. Coast Guard's *Findings of Fact*. As a result, according to the conclusions in the *Findings of Fact*: "The M/V *Summit Venture* was in the unique position of being the only vessel approaching a turn with the weather approaching and passing from astern. This denied Lerro the ability to 'sense' the changes in wind direction so critical to ship control." Lerro considered steering more sharply into the channel but did not for fear of colliding with the outbound *Pure Oil*. However, concerned about the deteriorating weather, *Pure Oil*'s pilot, John Schiffmacher, decided to turn out of the channel to anchor while still east of the bridge. He radioed *Summit Venture* to say that he was doing so at 0734. The transmission was never acknowledged.

Two minutes before, Lerro had seen part of the bridge superstructure off the starboard bow and immediately realized that far from being in Cut "A," *Summit Venture* was south of the main shipping channel. According to the Coast Guard's *Findings of Fact*, "At 0732 in quick succession, he ordered left full rudder, a double-full astern bell, and the anchors let go. At 0733, with the engines going astern and the rudder hard left, the starboard bow of the *Summit Venture* collided with bridge pier 2S." The force of the impact knocked loose the top of the pier, and a 1,000-foot section of the roadway, including 612 feet of the main span, fell into the water. Pier 2S collapsed, and piers 1S and 3S were severely damaged.

Immediately after the collision, Lerro broadcast a mayday call to which Coast Guard Group St. Petersburg replied. The exchange of information about the collision was swift, including the fact that there were people from the Skyway bridge in the water. It included Lerro's plea to "Stop traffic on the Skyway Bridge. There's some people in the water. Get emergency equipment out to the Skyway Bridge, now." (This chilling, desperate conversation between Lerro and the Coast Guard is too long to reprint here in its entirety, but a recording is accessible online: www.rushw.com/skyway/skyway.mp3.)

Because the geometry of the bridge makes it seem that the roadway disappears into nothingness, it was not immediately apparent to drivers that the bridge was gone. The first vehicle to stop in time skidded to a stop only 14 inches from the edge of the sagging surviving span. The four occupants of the yellow Buick owed their lives to the cau-

tion of driver Richard Hornbuckle, who only realized something was horribly wrong when he noticed the superstructure of the bridge was gone.

In all, the disaster resulted in the deaths of 35 people, occupants of six cars and a Greyhound bus that drove off the vanished span to plunge 150 feet into the wind-lashed waters of Tampa Bay. Autopsies determined that six people drowned; the remainder died of blunt trauma. Only one person drove off the bridge and survived, the driver and sole passenger of a pickup truck who managed to escape his sinking vehicle, which had bounced off the deck of the *Summit Venture*. There were no injuries among the ship's crew, and after repairs, the Liberian-flagged bulk carrier remained in service for another 13 years. The Port of Tampa remained closed until May 13, when enough of the channel was cleared to allow one-way traffic for shallow draft vessels assisted by a tug. Normal operations did not resume until June 23.

In its investigation, the Coast Guard found that "The proximate cause of the casualty was the decision of the pilot, John E. Lerro, to continue through the Sunshine Skyway Bridge from the vicinity of the intersection of Mullet Key Channel and Cut A Channel ... Complicating circumstances of zero visibility, high winds and loss of radar presentation created a situation not fully comprehended by Lerro." While the Coast Guard felt that his speed was immoderate given the circumstances, Lerro escaped more censure owing to the fact that "*Summit Venture* was beset by a localized storm of enormous proportions which could not have been foreseen ... In addition, the pilots of all vessels who encountered this weather were surprised by its suddenness and intensity to the point that quantifying data was abandoned in order to maintain control of their vessels." The Florida Board of Pilot Commissioners also accepted the findings of a hearing officer that Lerro commanded his vessel in a reasonable, prudent manner, and he eventually returned to work as a pilot.

The *Summit Venture* collision was not the first suffered by the Sunshine Skyway Bridge, and there were three minor incidents involving vessels and the bridge in 1980 alone. However, catastrophic losses due to vessel collisions with bridges are considered "extreme events with a very low probability of occurrence," according to Michael Knott and Prucz Zolan in "Vessel Collision Design of Bridges," a chapter in the *Bridge Engineering Handbook*, edited by Wai-Fah Chen and Lian Duan (Boca Raton: CRC Press, 2000). Knott and Zolan found that between 1960 and 1998, there were 30 major bridge collapses worldwide, which resulted in the deaths of 321 people. More than half of these died in a single incident in 1983, when a passenger ship on the Volga River in Russia passed beneath the side span of a railroad bridge and a crowded movie theater was scraped off the upper deck. The worst incident in the United States resulted from the collision of a barge tow and a railroad bridge near Mobile, Ala., in Sept. 1993. After becoming disoriented in a heavy night fog, the pilot of the towboat *Mauvilla* collided with a railroad bridge, knocking the rail bed out of alignment. A few minutes later, an eastbound Sunset Limited Amtrak train derailed and plunged into Bayou Canot with the loss of 47 lives. The Sept. 15, 2001, incident, where the Queen Isabella

Causeway leading to South Padre Island, Texas, collapsed after it was hit by the towboat *Brown Water V* and its barge, added eight victims to this list.

Although these incidents and the *Summit Venture* account for 80 percent of the victims of major bridge collisions and such catastrophic incidents are rare, vessel-bridge collisions are not at all rare. According to Knott and Zolan, the Coast Guard logs an average of 35 such incidents every day. Bridge engineers have in recent years addressed the issue of bridge safety in vessel collisions through more rigorous analysis of incident data. Among the most obvious things being considered are the horizontal and vertical clearances of the navigation span, channel layout and geometry (that is the angle at which a shipping channel passes under a bridge), and the characteristics of the vessels likely to pass under the bridge.

Regarding clearances, it was found that "bridges with a main span less than two to three times the design vessel length or less than two times the channel width are particularly vulnerable to vessel collision." At the time of the *Summit Venture* collision the width of the main span of the Sunshine Skyway Bridge was only 864 feet — less than half again as wide as the bulker was long — and inadequate, on the basis of this recommendation, even for the larger vessels of the early 1950s when the bridge opened. Also regarded as key to bridge safety are physical protection systems, including riprap islands built at the base of the bridge piers, fender systems attached directly to a pier; freestanding or attached piles, and dolphins — circular piles of sand or rock enclosed by steel sheet piles and capped with concrete. Dolphins are designed to absorb the impact of an errant vessel in much the same was as a highway crash barrier.

Almost immediately after the collision of the Sunshine Skyway Bridge, engineers began designing a single-span, cable-stayed bridge to replace the old bridges. Opened in 1987, the new Sunshine Skyway Bridge soars 197 feet over Tampa Bay, with a 1,200-foot-long main span over the shipping channel. Unlike the old bridges, the bases of the piers are protected by rubble islands, and the approaches to the piers are protected by dolphins designed to withstand 29.6 million pounds of force, more than 60 percent again the force caused by the *Summit Venture* collision. Although the new bridge was built 1,000 feet east of the old bridge to put it farther from the sharp turn between the Mullet Key and Cut "A" channels, the channel still does not run perpendicular to the bridge span as safety experts would recommend.

It is also hoped that the risk of vessel-bridge collisions can be lessened through the adoption of shipboard navigation systems such as the Electronic Chart Display and Information System and Automatic Identification Systems. However, given the increasingly broad economic impact of such accidents — the replacement cost of the Sunshine Skyway Bridge was $250 million, not including lost business while the Port of Tampa was closed; repairs to the *Summit Venture* were only $13 million — there is increased pressure on shipping interests to assume a more proactive responsibility for the wider impact of their activities.

by Lincoln P. Paine