



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

July 29, 2024

MIR-24-21

Contact of Recreational Vessel *Flagship 604* with Dock and Subsequent Marina Fire

On August 10, 2023, about 1705 local time, the rental houseboat *Flagship 604* (state number TN 0174 BD 219), with nine people aboard, was docking at the Sunset Marina on Dale Hollow Lake in Byrdstown, Tennessee, to refuel, when the bow struck one of the marina's gasoline fuel pumps, knocking it over (see figure 1 and figure 2).¹ Minutes later, a fire began near the gas dispenser and spread to the marina store and three pontoon boats moored at the marina. One injury was reported; no pollution was reported. The houseboat was not damaged. Damage to the marina and the pontoon vessels was estimated at \$1.75 million.



Figure 1. *Flagship 604* moored in 2024. (Source: Sunset Marina)

¹ (a) In this report, all times are central daylight time. (b) Visit [ntsb.gov](https://www.ntsb.gov) to find additional information in the [public docket](#) for this NTSB investigation (case no. DCA23FM046). Use the [CAROL Query](#) to search investigations.

Casualty Summary

Casualty type	Contact
Location	Dale Hollow Reservoir, Byrdstown, Tennessee 36° 32.04' N, 85° 9.79' W
Date	August 10, 2023
Time	1705 central daylight time (coordinated universal time -5 hrs)
Persons on board	9
Injuries	1 serious
Property damage	\$1.75 million est.
Environmental damage	None
Weather	Visibility 10 mi, broken clouds, winds west 10-15 mph, air temperature 78°F
Waterway information	Lake (formed by Dale Hollow Dam), depth 46 ft

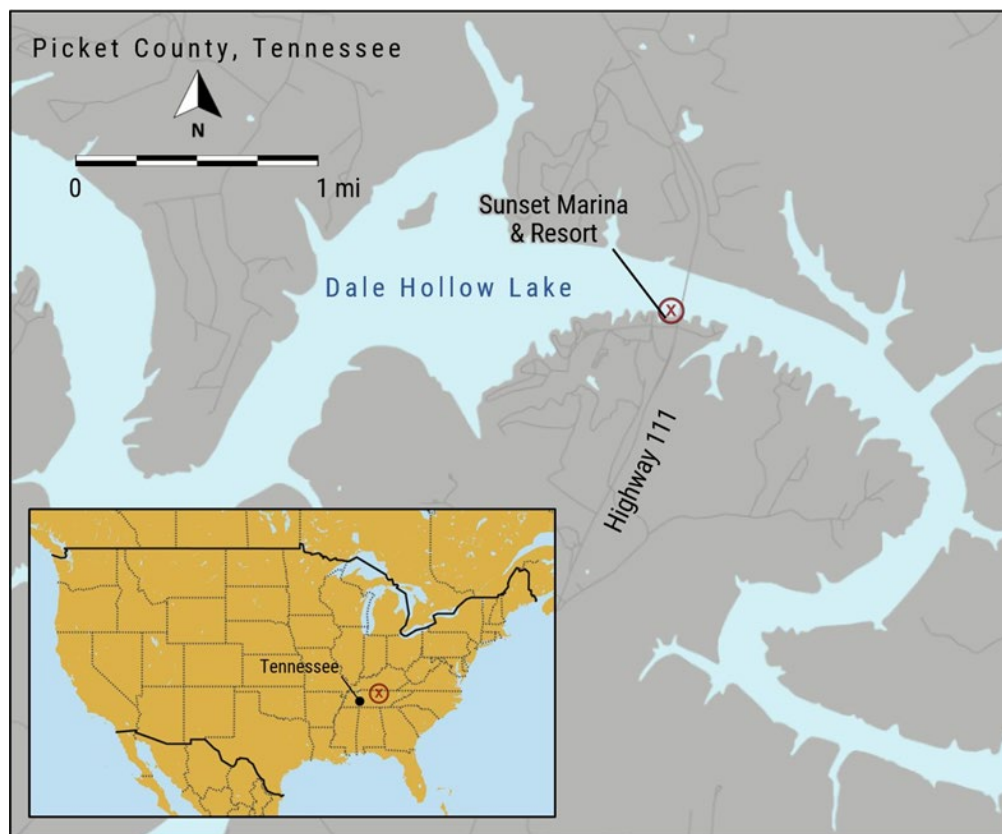


Figure 2. Area where the *Flagship 604* contact occurred, as indicated by a circled X. (Background source: Google Maps)

1 Factual Information

The 74-foot-long *Flagship 604* was a houseboat constructed of welded aluminum built by Thoroughbred Houseboats in Albany, Kentucky, in 2004. It was owned by Sunset Marina & Resort, which offered houseboat rentals from its marina. The vessel was propelled by one 150-hp Mercury outboard engine. The boat's superstructure extended for most of the length of the vessel; an upper deck on top of the superstructure was fitted with railings and had a mesh skirt between the top rail and the lower course. The boat had a "duckbill" bow—a deck overhang that extended over the water 1.25 feet at the center of the bow and up to 3.75 feet on both the port and starboard sides (as measured from the top of the bow stem just below the deck).

On August 4, 2023, a person rented *Flagship 604*, to be used by a group of nine, from Sunset Marina on Dale Hollow Lake in Byrdstown, Tennessee, for the week. The rental agreement designated one of the adults as the "driver" (operator).

On August 10, about 1705, the designated operator was approaching the Sunset Marina dock, from the west, to refuel. The wind was from the west at 10-15 mph. The operator told the Tennessee Wildlife Resources Agency (TWRA) investigator that, as he approached the dock [starboard side to] and shifted into reverse, the vessel's engine died, and the wind pushed the boat along the dock and twisted the vessel—moving the stern away from the dock and the bow into the dock. The vessel's duckbill bow, which extended over the dock, struck a gas dispenser (pump) 5 feet from the edge of the dock. The dispenser fell over, and gasoline began to spray from the broken 2-inch fuel line supplying the dispenser from shore. The spray covered areas of the dock within 50 feet of the gas dispenser, including several electric ice freezers and a live bait tank with an electric circulating pump.

The marina's general manager pushed the emergency stop for the fuel pump. Another marina employee jumped on board the *Flagship 604* and drove it to another marina dock. The marina general manager noticed exposed electrical wiring at the dispenser and attempted to close the dispenser's fuel shutoff valve (under the dispenser and above the dock) to stop the flow of fuel from the damaged fuel line. However, before he could close the valve, a fire began, igniting his clothing. The marina manager was later transported to a hospital where it was determined that he incurred second- and third-degree burns.

The marina owner, who was about 1,000 feet away, heard an explosion and saw a fireball and black smoke rising 20-30 feet above the marina store roof. When he arrived at the scene, the fire was burning on the wooden deck around the fuel dispenser. The fire quickly expanded from the dock to the marina building/store just behind the fuel dispenser. Fire department personnel were called; they arrived at

1715 and immediately worked to prevent the fire from spreading to other structures in the marina and resort complex. They cleared the location by 2340.

The marina store was destroyed (see figure 3). Three rental pontoon boats tied up on the west side of the marina store incurred damage to their seats and deck carpeting from the heat of the fire. *Flagship 604* was not damaged.

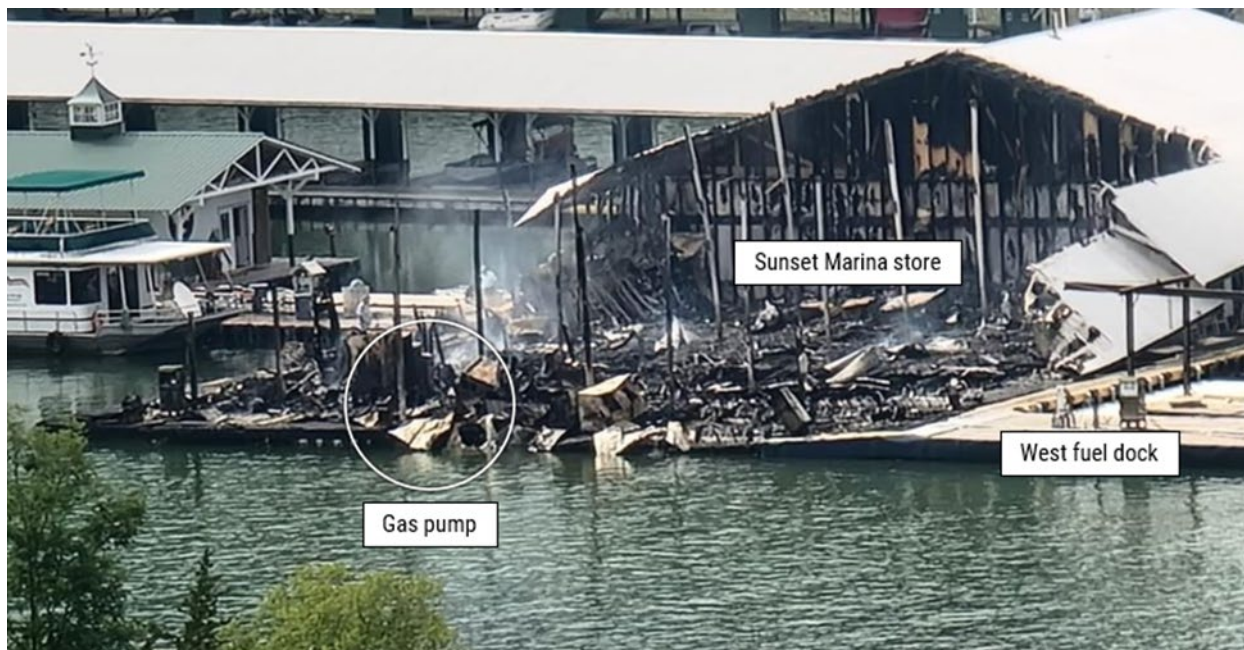


Figure 3. Sunset Marina store and fuel dock after the fire. (Source: TWRA)

The driver/operator of the *Flagship 604* told the TWRA boating accident investigating officer that he had 10-100 hours of boating operator experience and no boating operator education.² The operator also told the TWRA investigator that he had experienced the houseboat's engine cutting off when shifting into reverse previously during the rental. Shortly after the fire, a Sunset Marina mechanic checked the boat's engine controls; he did not find any issues with the throttle or engine.

In 1997, when the three dispensers in front of the marina store and the three on the west dock were installed, they met the Tennessee Fire Code standards in effect at that time. These standards included protecting the fuel pipes against physical damage arising from impact (also the current standard) and having a manually operated emergency shutoff valve beneath each dispenser. At the time of the fire, the three fuel dispensers in front of the marina store (where the fuel dispenser was struck) were 5 feet from the edge of the dock, which was considered

² The TWRA Boating Accident Report categorized operator experience into six categories: No Experience, Under 10 hours, 10 to 100 hours, 101 to 500 hours, Over 500 Hours, and Unknown.

an adequate measure to protect the dispenser fuel pipes against physical damage arising from impact. All the marina's dispensers included manually operated emergency shutoff valves.

The current Tennessee Fire Code for marina fuel docks requires that a dispenser have an automatic emergency shutoff valve that will shut off the flow of fuel if a dispenser is dislodged by a collision.³ (Sunset Marina did not retrofit its existing fuel installations to meet this requirement, nor were they required to.)

Following the fire, the marina relocated the three fuel dispensers from in front of the marina store to the center of a new 20-foot-wide east dock, 9 feet 4 inches from the edge of the dock. The owner also installed an automatic emergency shutoff valve (shear valve) in the fuel supply line just below each of the dispensers on the east and west docks.

2 Analysis

The operator told investigators that he lost propulsion (and steering) as he attempted to dock the houseboat starboard side to the dock; a marina mechanic did not find any issues with the boat's engine after the contact. However, even if the 150-hp engine had been fully functional, docking the 74-foot-long houseboat in the reported 10-15 mph winds would have been a challenge because of the houseboat's large sail area, which included the vessel's hull above the water, the superstructure, and the upper deck rail skirts. The winds from the west, acting on the vessel's sail area, set the vessel east along the dock—twisting the houseboat to the east and moving the bow into the dock, causing the houseboat's duckbill bow to extend over the dock and strike the gas dispenser (see figure 4).

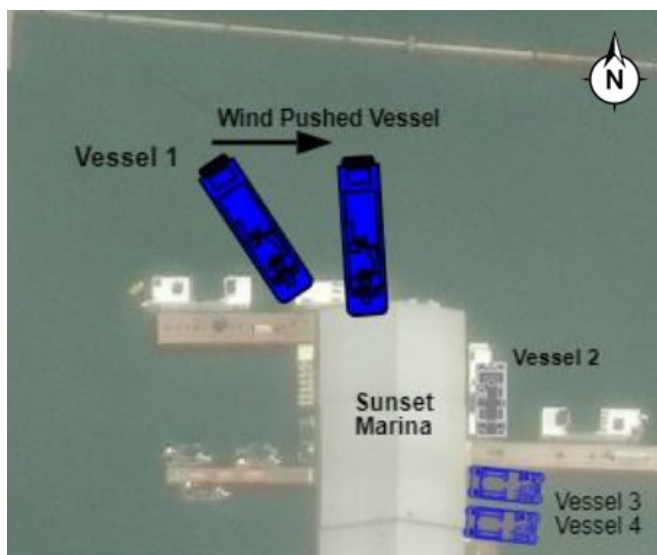


Figure 4. Diagram from the TWRA boating accident report showing the *Flagship 604* (Vessel 1) and the location of the additional damaged vessels. (Background source: TWRA)

³ The Tennessee State Fire Marshal's Office uses the International Fire Code, published by the International Code Council. They first adopted the International Fire Code standards on December 16, 2008.

The gas dispenser was set back 5 feet from the dock face as a measure to meet the standard for protecting fuel pipes against physical damage arising from impact for marina fuel docks (both at the time of dock construction and currently) as required by the Tennessee Fire Code. The 5-foot setback was intended to protect the gas dispenser from strikes by docking boats and prevent contact with the gas dispenser by boats with standard bow designs coming alongside the dock. However, in this casualty, the dock's height and houseboat deck's overhang dimensions (above the water and from the bow stem) allowed the houseboat's duckbill bow to freely move over the fueling dock and strike the dispenser. Therefore, the 5-foot setback was not sufficient to protect the gas dispenser from the contact from the duckbill bow of *Flagship 604*.

The contact dislodged the gas dispenser, and the fuel line broke, exposing wiring and spraying gasoline from the line onto a bait tank and ice machines powered by electric motors. Almost immediately, the vapors covering the area around the fuel dispenser ignited into a fire. With the presence of the exposed wiring and electric motors within the fuel spray's radius, it is likely that an electrical arc ignited gasoline vapors.

3 Conclusions

3.1 Probable Cause

The National Transportation Safety Board determines that the probable cause of the contact and subsequent fire at the Sunset Marina was a houseboat's "duckbill" bow striking a gasoline fuel dispenser (pump) when docking in windy conditions, which caused an undetermined electrical source on the dock to ignite vapors from the broken gasoline fuel line. Contributing to the contact was the proximity of the gas pump to the dock edge.

Vessel Particulars

Vessel	<i>Flagship 604</i>
Type	Yacht/Boat (Boat)
Owner/Operator	Sunset Marina and Resort, Inc. (Commercial)
Flag	United States
Port of registry	N/A
Year built	2004
Official number (US)	DZU72H71F404
IMO number	N/A
Classification society	N/A
Length (overall)	74.0 ft (22.6 m)
Breadth (max.)	20.0 ft (6.1 m)
Draft (casualty)	1.8 ft (0.5 m)
Tonnage	N/A
Engine power; manufacturer	1 x 150 hp (111.9 kW); Mercury outboard engine

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For more detailed background information on this report, visit the [NTSB Case Analysis and Reporting Online \(CAROL\) website](#) and search for NTSB accident ID DCA23FM046. Recent publications are available in their entirety on the [NTSB website](#). Other information about available publications also may be obtained from the website or by contacting—

National Transportation Safety Board
 Records Management Division, CIO-40
 490 L’Enfant Plaza, SW
 Washington, DC 20594
 (800) 877-6799 or (202) 314-6551