National Transportation Safety Board

Marine Accident Brief

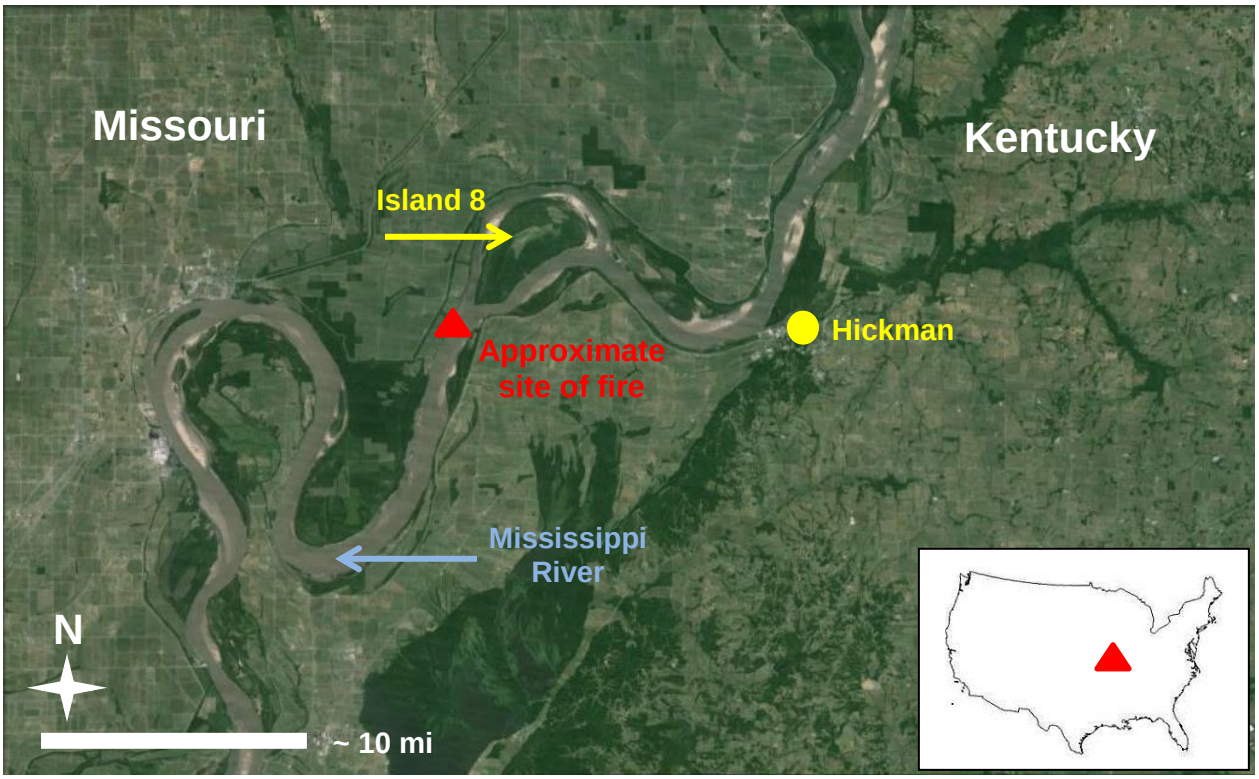
Engine Room Fire On Board Towing Vessel *Marguerite L. Terral*

Accident no.	DCA-12-LM-020
Vessel name	*Marguerite L. Terral*
Accident type	Fire
Location	Lower Mississippi River, mile marker 911, near Hickman, Kentucky
Date	June 9, 2012
Time	1705 central daylight time (coordinated universal time –5 hours)
Injuries	None
Damage	$2.6 million
Environmental damage	No discharge of oil reported
Weather	Clear skies; winds 10–15 knots from the south-southeast; visibility of 5 nautical miles; air temperature 85°F; river current at 3 knots to the south.
Waterway information	Mississippi River – Major water highway. The US Army Corps of Engineers maintains a 9-foot-deep shipping channel for towboats and barges between Baton Rouge, Louisiana, and Minneapolis, Minnesota.

On June 9, 2012, about 1705 central daylight time, the uninspected towing vessel *Marguerite L. Terral* with six crewmembers on board was pushing 12 empty barges on the Mississippi River near Hickman, Kentucky, when the vessel's port engine caught fire. The crew tried unsuccessfully to extinguish the fire before evacuating onto one of the barges. No one was injured nor did the accident cause any pollution. The damage to the *Marguerite L. Terral* was estimated to be $2.6 million.

The *Marguerite L. Terral* on an unknown waterway in 2007. (Photo by William; Picasa Web Albums)

When the fire started, the *Marguerite L. Terral* was northbound on the Mississippi River, about 13 miles downriver of Hickman. The six crewmembers on board included the captain, the mate (also termed "pilot" on river waterways), and four deckhands.



Aerial view of the Mississippi River in the area near the fire. (Background by Google Earth)

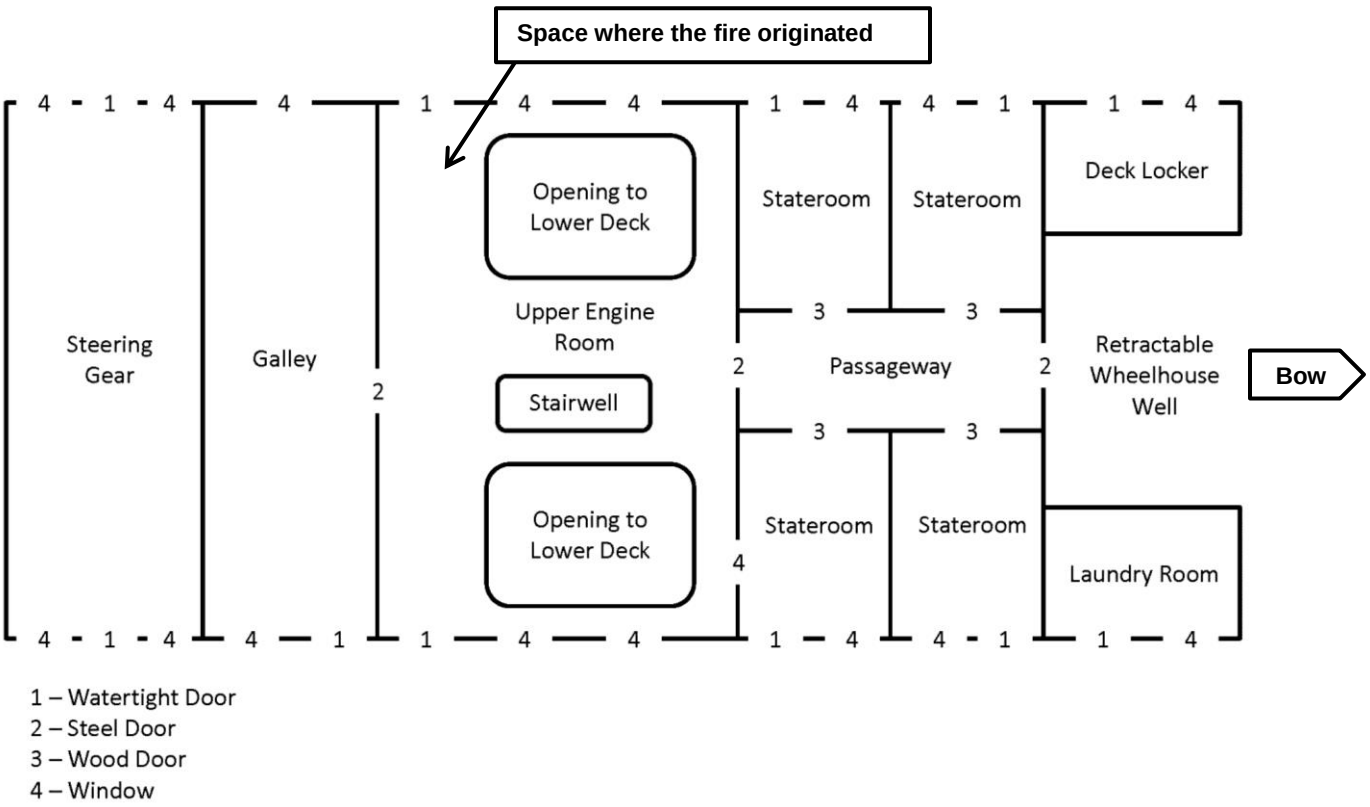
At 1705, an alarm sounded in the wheelhouse. The captain, who was making a round of the vessel before taking his watch, saw flames at the aft end of the port engine near the turbocharger. He also saw flames through the open starboard-side door to the engine room. He sounded the general alarm and ordered a deckhand to wake an offduty crewmember who was sleeping. The mate, who was second in command and in the wheelhouse at the time, requested assistance from other vessels in the area on the vessel's very high frequency (VHF) radio.

The *Marguerite L. Terral* was equipped with a fixed CO_2 fire suppression system for the engine room. At 1706, the captain and two deckhands tried to reach one of the stations for releasing the CO_2 remotely (the station located on the exterior of the vessel, aft of the portside door to the engine room). However, because the portside door to the engine room was open—like the starboard-side door—smoke and fire extended out from the engine room, preventing the crew from reaching the CO_2 pullboxes. The fire suppression system could also have been activated directly from the manual pull at the CO_2 bottles located in the steering gear room; however, no evidence indicates that the crew attempted to activate the system from this room.

As part of suppressing a fire, the area where the fire is located needs to be closed off—shutting all doors, windows, and ventilation dampers—so that oxygen does not fuel the fire and displace the fire suppression agent. If the crew had activated the vessel's fixed CO_2 system, the ventilation system in the engine room would have automatically shut down. Because the crew did not do that, they would now have to close the ventilation manually. However, the ventilation shutdown levers were located inside the engine room, and the fire and thick smoke

prevented the crew from accessing them. The ventilation in the engine room was therefore not shut down.

At 1708, the crew retrieved portable fire extinguishers from the galley and discharged the CO_2 contained in them in the direction of the port engine through the engine room's starboard-side door. According to crew statements, the crew did not close the doors to the engine room while discharging the CO_2. At 1710, after the discharge of the portable fire extinguishers proved unsuccessful in controlling the fire, the captain ordered everyone to abandon the vessel and evacuate onto the nearest of the 12 barges under tow.



Drawing of the main-level layout on board the *Marguerite L. Terral*. (Original drawing by the Coast Guard's Towing Vessel National Center. For the purpose of this report, the drawing has been slightly modified.)

At 1711, just before abandoning the *Marguerite L. Terral*, one of the deckhands shut down the fuel supply to the vessel's engines. The vessel then lost propulsion and drifted with the barges less than 1 mile before grounding near the southern end of Island 8, about 14 miles downriver of Hickman.

Local responders arrived on scene and assisted in the firefighting, using portable pumps. The towing vessel *Edna T. Gattle* arrived at 1900. Its crew used the onboard fire pump to fight the fire, and the vessel pushed the *Marguerite L. Terral* further against the river bank to ensure that the tow did not refloat and endanger other vessels in the river. The fire was finally extinguished at 2200.

The scene after the assisting towing vessel *Edna T. Gattle* arrived. The evacuated crewmembers from the *Marguerite L. Terral* are standing on the barge adjacent to their vessel. (Photo provided by the Coast Guard; unknown photographer)

All spaces and equipment on the *Marguerite L. Terral*'s main and upper decks were damaged or destroyed, except for the wheelhouse and the portside deck locker. The fire spread from the engine room to the staterooms and laundry room through a window between the engine room and one of the staterooms. This window gave way from the intensity of the fire's heat. Below the main deck, the damage was limited to the engine room.

Fire damage to the vessel. (Photo by the Coast Guard)

Because the crew was unable to access the ventilation shutdown levers in the fire, the US Coast Guard Inspection and Compliance Directorate issued Safety Alert 05-12, titled "Pressure Switch Location for Fixed Fire Suppression Systems," in December 2012. (See the last page of this brief.) The Coast Guard published Safety Alert 05-12 to educate the marine industry about the issues involving the installation and locations of control systems associated with fire suppression systems. The safety alert emphasized that control switches for fire suppression systems should not be located in the space they are designed to protect.

The source of the fire on board the *Marguerite L. Terral* could not be identified. The investigation did reveal that on May 31, 2012, 9 days before the fire, work had been done to repair a reported oil leak on the port engine, near the area where the fire was first sighted by the vessel crew.

Probable Cause

The NTSB could not determine the origin of the engine room fire on board the *Marguerite L. Terral*. Contributing to the extent of the fire damage was the crew's failure to set fire boundaries, shut down the ventilation, and use the onboard fire suppression equipment effectively.

Vessel Particulars

Vessel	*Marguerite L. Terral*
Owner/operator	Terral River Service, Inc.
Port of registry	Lake Providence, Louisiana
Flag	United States
Type	Towing vessel
Year built	2002
Official number (US)	1129737
Construction	Steel
Length	99 ft (30 m)
Hull depth	10.2 ft (3.1 m)
Beam/width	32 ft (9.7 m)
Gross and/or ITC tonnage	326 gross tons
Engine power; manufacturer	1,500 hp (1,117 kW); 2 main diesel engines, Caterpillar 3512
Persons on board	Six

Adopted: March 10, 2014

The NTSB has authority to investigate and establish the probable cause of any major marine casualty or any marine casualty involving both public and nonpublic vessels under 49 *United States Code* 1131. This report is based on factual information provided by the US Coast Guard from its informal investigation of the accident. The NTSB did not conduct its own on-scene investigation.

UNITED STATES COAST GUARD

U.S. Department of Homeland Security

MARINE SAFETY ALERT

Inspections and Compliance Directorate

December 31, 2012 Alert 05-12
Washington, DC

Pressure Switch Location for Fixed Fire Suppression Systems

Where's yours located?

This safety alert addresses the location of fire suppression system pressure switches aboard vessels. These critical components sense the activation of the system and then electrically secures the ventilation systems operating in the protected space. Securing the ventilation is essential in extinguishing a fire onboard a vessel. It assists in isolating the fire within the space, minimizes the introduction of additional oxygen to fuel the fire and prevents the loss of fire suppression agents from the space.

Recently, a vessel with an installed fixed CO_2 fire suppression system, suffered extensive damage due to a fire that started in the engine room. During the firefighting efforts the crew reported that the engine room ventilation could not be secured. A post casualty damage survey of the vessel revealed that the pressure switch used to secure the ventilation was located within the engine room. See the photograph of the damaged pressure switch at the right and new switch below.

Fixed CO_2 systems on inspected/regulated vessels need to be type approved and installed in accordance with applicable regulations; 46 CFR 25.30-15, 46 CFR Subpart 76.15, 46 CFR Subpart 95.15, 46 CFR 118.410, etc. These regulations require all controls and valves for the operation of the system to be outside the space protected, and notes they cannot be located in any space that might be cut off or made inaccessible in the event of fire in the protected spaces. The Coast Guard considers pressure switches that are used in such systems a "control."

For Uninspected Towing Vessels, 46 CFR 25.30-15 (b) requires installation in accordance with 46 CFR Subpart 76.15 and reiterates the location requirements.

The Coast Guard ***strongly reminds*** Owners and Operators of vessels with installed fixed fire suppression systems to ensure that these switches are properly located aboard their vessels. If the pressure switch or switches are located within the space being protected, they should be relocated by a properly trained fire suppression service technician. Doing so will assist in ensuring system functionality and accessibility in the event of an emergency. Failing to do so could have serious consequences to the vessel, its crew and the environment.

This safety alert is for informational purposes only and does not relieve any domestic or international safety, operational or material requirement. Developed by the Office of Commercial Vessel Compliance, Washington, DC. Questions may be addressed to CG-CVC-1@uscg.mil.

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