NATIONAL TRANSPORTATION SAFETY BOARD
Office of Research and Engineering
Materials Laboratory Division
Washington, D.C. 20594

July 18, 2018

MATERIALS LABORATORY FIRE FACTUAL REPORT Report No. 18-060

A. ACCIDENT INFORMATION

Place	:	Port Richey, Florida
Date	:	January 14, 2018
Vehicle	:	MV Island Lady
NTSB No.	:	DCA18FM010
Investigator	:	Brian Young IIC-OMS

B. ACCIDENT SUMMARY

About 1600 on the afternoon of January 14, 2018, a fire broke out in an unmanned space on the US small passenger vessel *Island Lady* near Port Richey, Florida, during a scheduled transit to a casino boat, located about 9 miles off the coast of Florida in the Gulf of Mexico. A captain, three deckhands, 11 employees, 2 pre-hire employees, and 36 passengers were aboard the vessel at the time of the fire.

The captain turned the *Island Lady* around to return to the dock after receiving a high temperature alarm on the port engine. During the return trip, smoke began filling the engine room and main deck, and the captain deliberately ran the vessel aground close to shore in shallow water to evacuate the passengers. All crewmembers, employees, and passengers evacuated the vessel by jumping into the water and wading ashore. Fifteen people were injured and transported to local hospitals. One passenger died in the hospital hours after the fire. The *Island Lady*, valued at $450,000, was declared a constructive total loss.

C. VESSEL INFORMATION

The *Island Lady* was a 72-foot boat of fiberglass (FRP) over wood construction with twin diesel engines[1]. It was built in 1994. The propulsion plant consisted of 2 Caterpillar model

[1] The *Lady Island* was designated as a Subchapter T small passenger vessel under 46 CFR Part 175. This subchapter applies to vessels less than 100 gross tons that carry 150 or less passengers, or has overnight accommodations for 49 or less passengers, and that (1) carry more than six passengers, including at least one for hire**;** (2) chartered with a crew provided or specified by the owner or the owner's representative and carrying more than six passengers; (3) chartered with no crew provided or specified by the owner or the owner's representative and carrying more than 12 passengers; or (4) If a submersible vessel, carries at least one passenger for hire; or (5) Is a ferry carrying more than six passengers. Due to its date of construction (prior to 1996), the vessel was considered an “old T” vessel.

3406E turbocharged diesel engines and vessel power was provided by 2 Kubota generators. The exhaust system for the engines was a wet-type exhaust system[2] with FRP exhaust ducts that exited out the stern of the vessel.

D. EMERGENCY RESPONSE

At 1604, the Pasco County emergency services dispatchers received a 911 call from a resident on Harborpointe Drive, notifying them of a fire on board a boat in the river and that people were in the water. Two more 911 calls were received immediately after the initial call from passengers also reporting the fire onboard the shuttle boat. Both passenger callers stated that they believed all of the people were off the boat. A total of 9 calls were made to 911 regarding this incident.

Two patrol officers and a detective from Port Richey Police Department were the first responders to arrive on scene at approximately 1615. Pasco County fire department units began arriving at approximately 1619. Additional fire, emergency medical and police units from Pasco County were dispatched to the scene including marine and air units. Homeowners and residents near the incident also provided assistance in getting passengers out of the water and providing shelter. Florida Fish and Game, US Coast Guard, Tarpon Springs Police Department, Dunedin Police Department and Pinellas County emergency services provided mutual aid.

E. WRECKAGE DESCRIPTION

The vessel was completely destroyed by fire as shown in Figure 1. The engines, generators and any remaining metallic components including pieces of the fixed firefighting system were removed from the river and stored at the Pasco County Sherriff Department. Portions of the engines and other metallic items are shown in Figures 2 and 3.

[2] In a wet exhaust system, water-cooled inboard engines inject cooling water into the exhaust pipe, which cools the exhaust and muffles engine noise. The exhaust then pushes the water out the exhaust pipe. Because of the reduced exhaust temperatures, exhaust piping does not have to be constructed of noncombustible material.

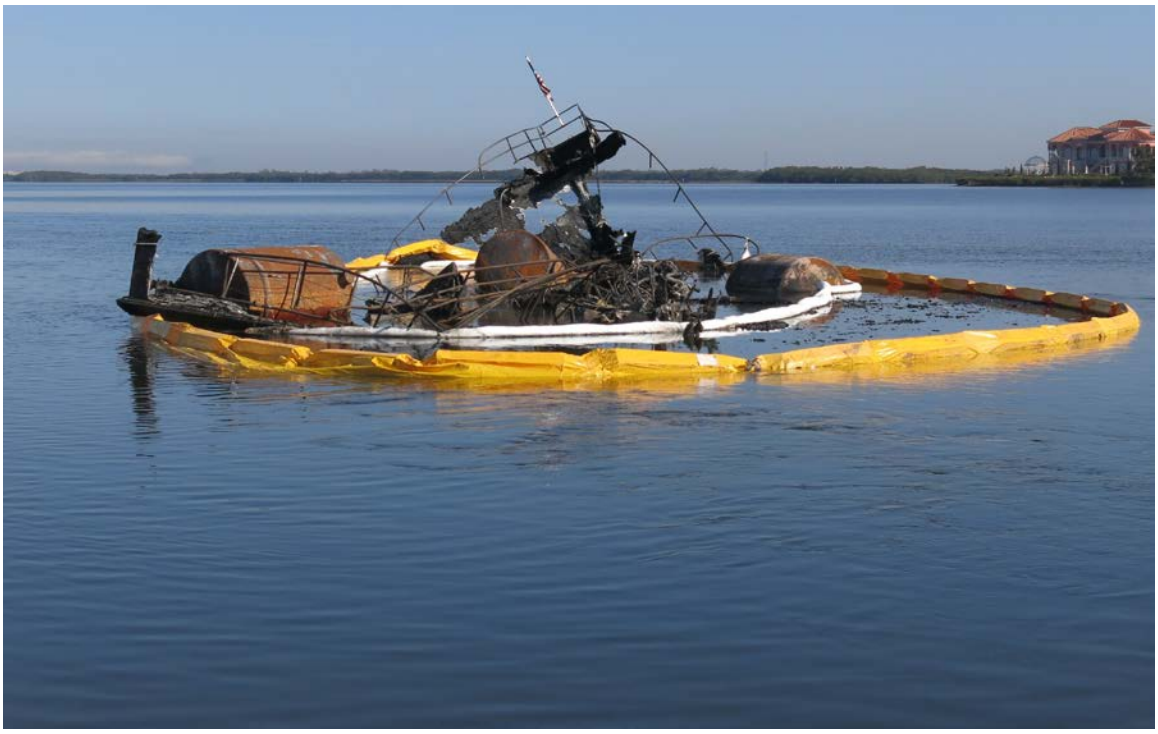

Figure 1. MV *Island Lady* postfire prior to removal from the river.

Figure 2. Portions of the starboard (right) and port (left) engines after recovery.

Figure 3. Other metallic components recovered from accident site.

On April 30, 2018, investigators and service representatives from Ring Power, a Caterpillar dealer and service provider, performed an examination and teardown of the engines.

Port Engine

The examination began by removing the front camshaft gear, rocker shafts and clearing the loose aluminum off the top of the head. Melted aluminum was removed from around the injectors and head bolts. The injector hold down bolts were removed and the injectors out pulled out. The injectors were visually inspected individually. The cylinder head bolts were removed and with the help of the boom crane, the head was removed for inspection of the valves and tops of the pistons. In order to view the pistons from the bottom to inspect the condition of the skirts, the cylinder head was put down on wood pieces, the block was lifted up and reset down on its side. The piston skirts were melted. A crack in the engine block was found between the 4th and 5th cylinder as shown in Figures 4 and 5. The spacer plate from the engine was removed to better visualize the crack. The crack started at the number 5 cylinder liner through the water passage and extended down the side of the block approximately 8 inches. According to the Ring Power service report, approximately 98% of all aluminum, bronze, copper, and brass parts were missing including the heat exchanger body, after cooler housings, front gear cover, flywheel housing, raw water pump housings, base and valve cover, oil pan and other smaller housings.

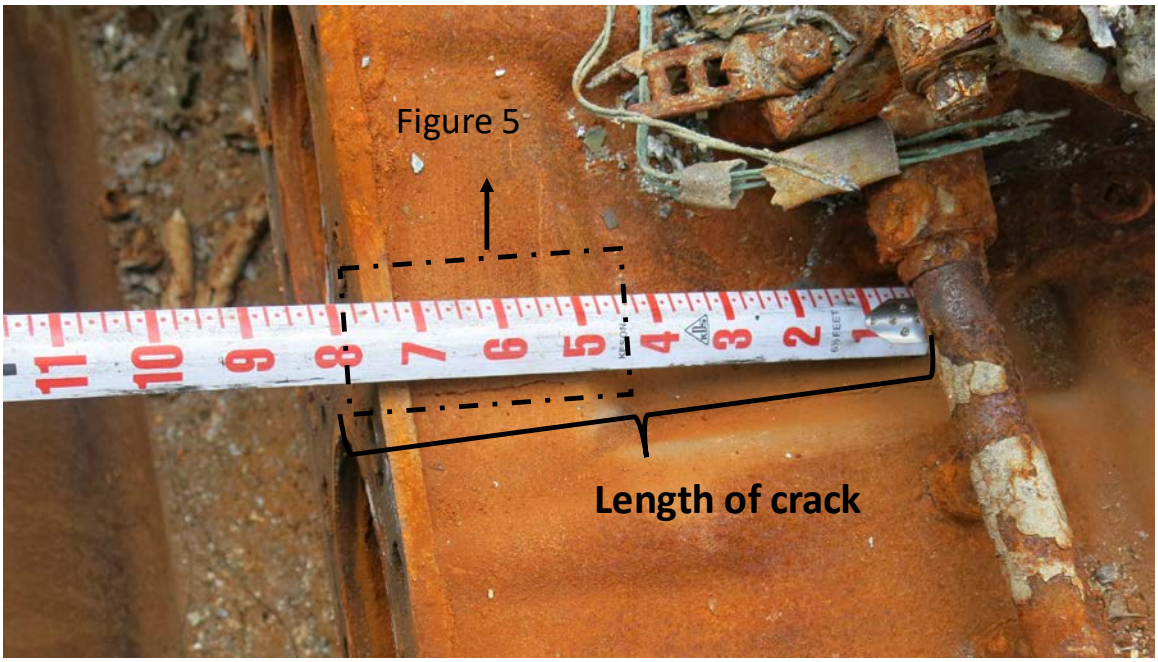

Figure 4. Crack in starboard engine block at cylinder #5.

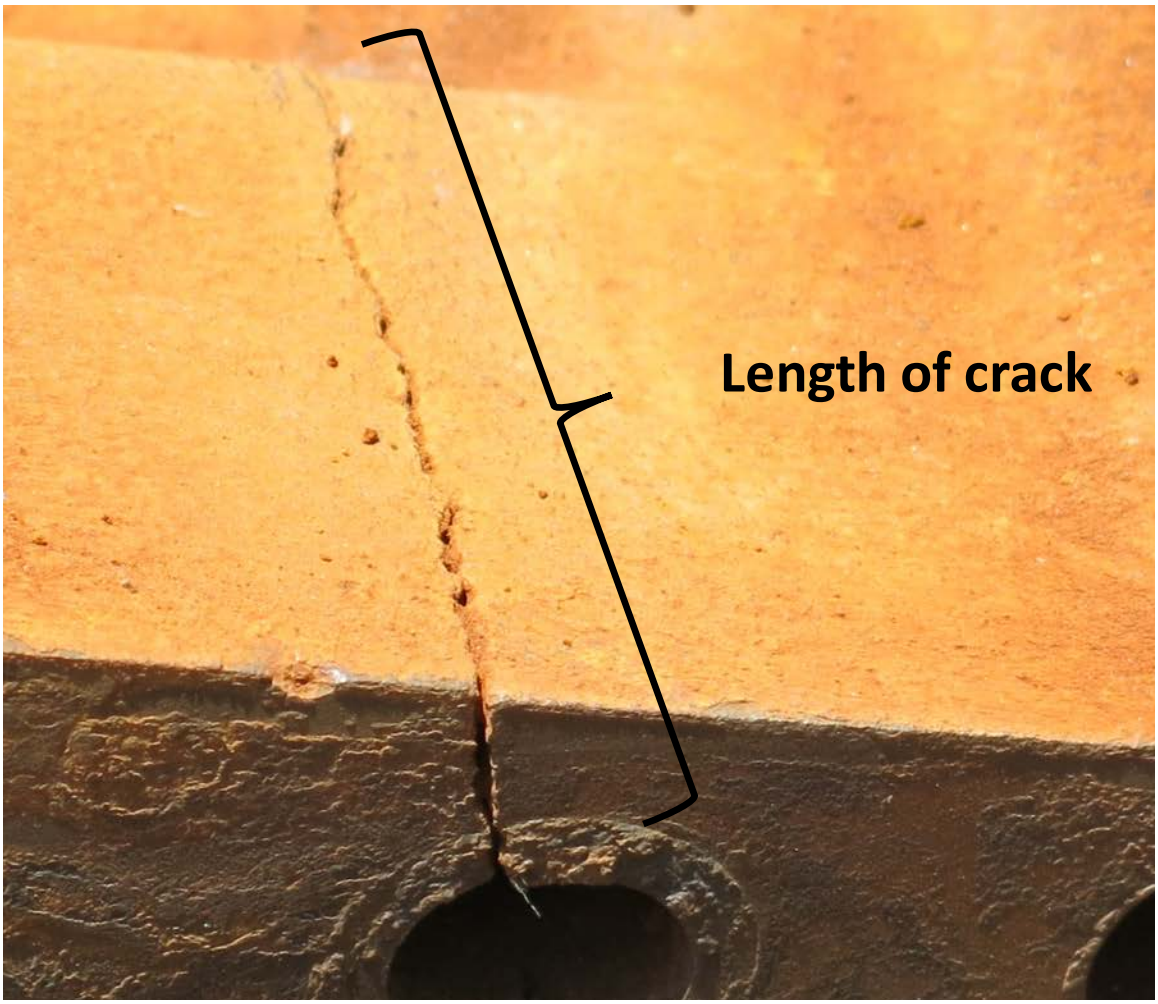

Figure 5. Closeup photograph of full thickness crack in starboard engine block at cylinder #5.

Starboard Engine

The thermal damage on the starboard engine was similar to the port engine but not quite extensive.

F. FIRE PROTECTION SYSTEMS

1. Fire Suppression System

Title 46 Part 181 Section 400 of the Code of Federal Regulations (46CFR181.400) requires a space containing propulsion machinery to be equipped with a fixed gas fire extinguishing system. The *Island Lady* was equipped with a Kidde custom engineered, manually operated

carbon dioxide system[3,4]. The system was installed in 1999. The last maintenance on the system was the yearly maintenance and inspection performed in May 2017 by a third-party fire protection inspection/service company. The system installation drawing is shown in Figure 6.

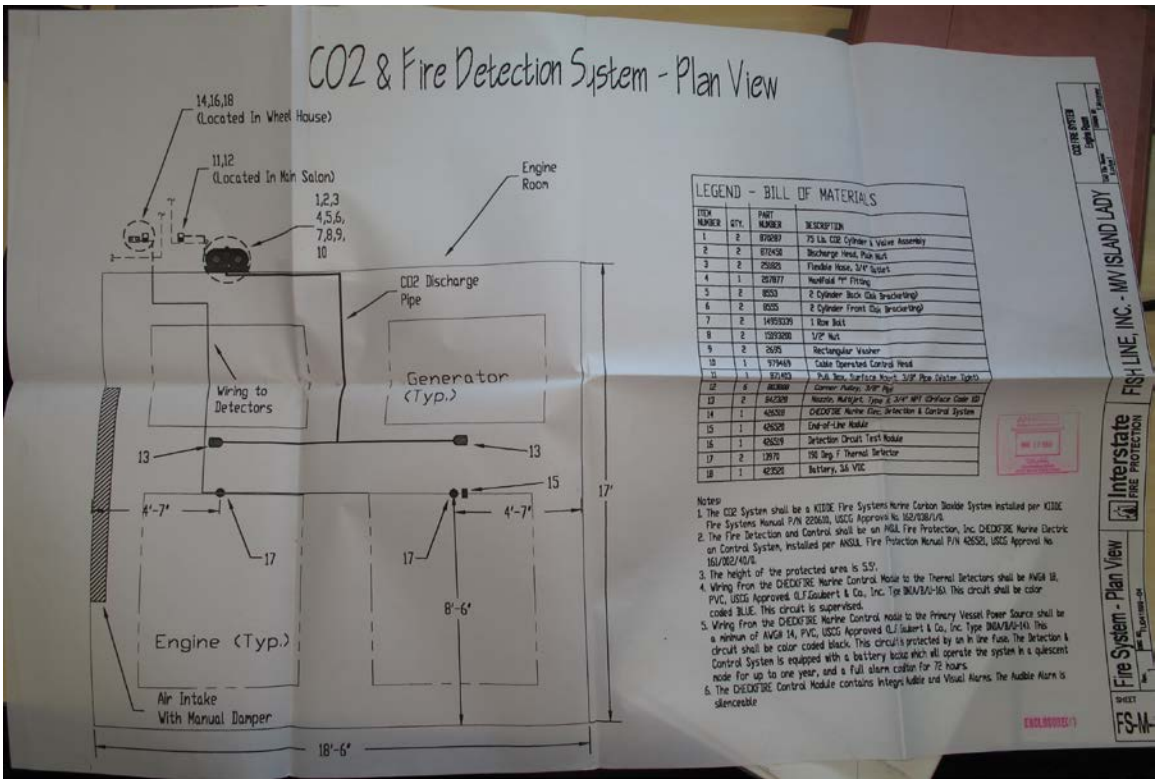

Figure 6. Fire suppression system installation drawing.

The system consisted of two 75-pound cylinders of carbon dioxide (CO_2) located in a compartment aft of the engine room[5]. A distribution line from the cylinders penetrated through the aft engine room bulkhead, traveled down the centerline of the engine room to a tee that terminated in two bell shaped discharge nozzles over the aft end of each engine.

According to the drawings, a pull box located in the Main Salon was used to remotely actuate the suppression system[6]. The ventilation dampers were manually operated and could be remotely closed from a pull station also located in the Main Salon.

[3] The Kidde system was installed as per the installation manual Kidde Part number 220610, USCG Approval No. 162/038/1/0.

[4] Custom engineered fire suppression extinguishing systems are systems that are specifically designed for an individual vessel's engine room. A system is designed to meet the needs of that particular space and the system is built with approved components.

[5]The May 2017 suppression system maintenance report contained a note that stated the CO_2 cylinders were due for hydrostatic testing. Investigators were not able to determine if this testing was completed prior to the fire.

[6] Remote-manual actuation was accomplished via cable routed from the cylinders to the pull box. The pull boxes are connected to the control heads (located on the storage cylinders or stop valves) via 1/16-inch stainless steel cable. Corner pulleys was used to change direction of the cable routing.

The discharge nozzles and portions of the distribution lines were accounted for during the postaccident examination as shown in Figure 7.

Figure 7. Discharge nozzles for fixed fire suppression system.

2. Fire Detection System

In accordance with 46CFR181.400, a space containing propulsion machinery is required to be equipped with a fire detection system of approved type. The fire detection system onboard the *Island Lady* was a custom designed and built system comprised of a control panel manufactured by Checkfire with two 190 °F heat detectors wired directly to a control module located on the bridge. Diagrams of the panel was found in the vessel file as shown in Figure 8.

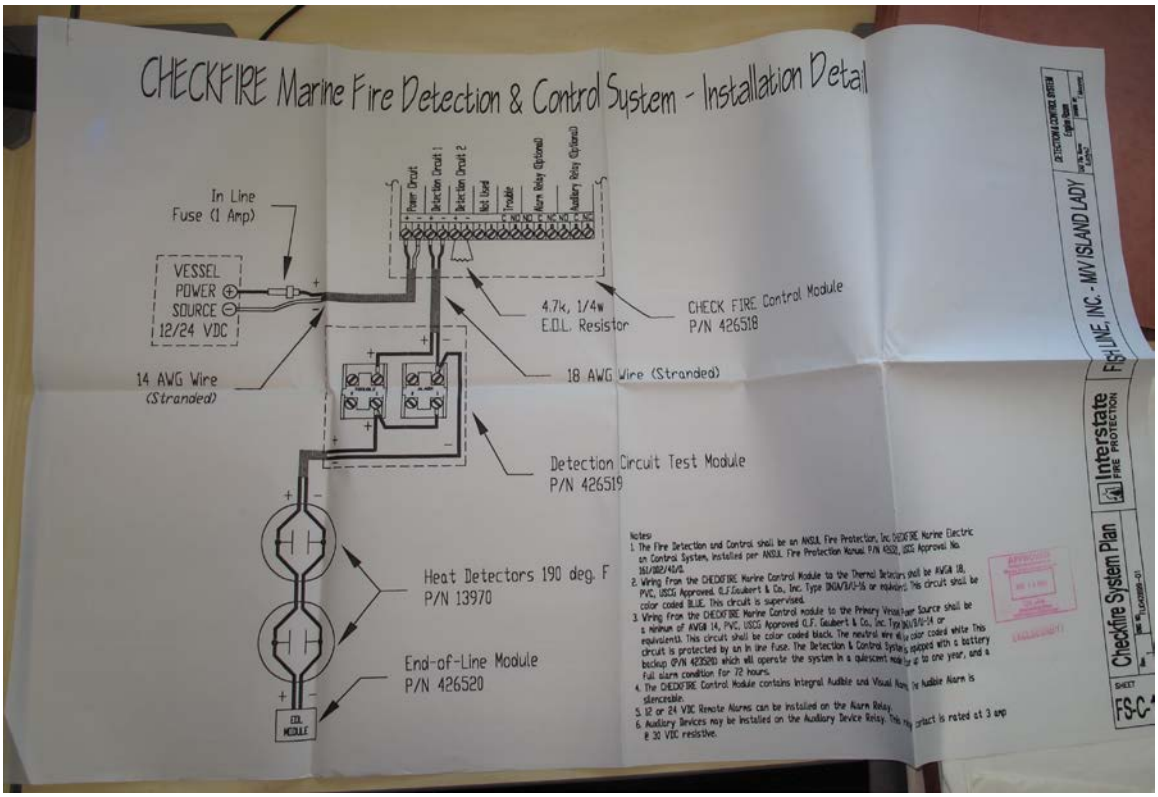

Figure 8. Installation drawing for fire detection system.

According to the drawing, an end of line device was installed at the end of a circuit to "supervise" the circuit.[7] 46CFR161.002-10 requires circuits extending from a control unit to the fire detectors to be electrically supervised.

This system was required to be tested yearly. No record of the last test was found. The system was not mentioned in the last USCG inspection. Firefighting system/equipment was listed as "Inspected Satisfactory" on the November 2015 inspection report. The fire detection system was not specifically listed in that report.

No heat detectors were found in the debris. In addition, the alarm panel was not found in the debris. These components were assumed consumed by the fire.

Nancy B McAtee
Fire and Explosion Specialist

[7]An end of line device is an electrical device, usually a resistor that monitors power through a system. In a supervised circuit, the resistor, usually installed in the farthest point from the alarm control unit, restricts the flow of current to a known value. The panel monitors this resistance. If there is a change in the flow of current due to the activation of a detector or loss of power in the system, it creates a change in the resistance and this is registered at the panel and the panel alarms.

Technical Review of Draft Factual Reports: Ring Power – Scott Elferdink

Party Comments by email/letter dated: 09/14/2018

NTSB Draft Factual Report for Tech. Review

Page/Line	NAME OF PARTY COMMENTS	NTSB – Disposition of Party Comments
4/2	"Ring Power – Scott Elferdink: Left engine is port, right engine is starboard	Updated in factual report
6/2	Ring Power – Scott Elferdink: Crack was in port engine block	Updated in factual report
6/4,5,6	Ring Power – Scott Elferdink: It appears port and starboard is reversed in this statement	Updated in factual report

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