MARINE OCCURRENCE REPORT

FIRE ALERT

FISHING VESSEL "THERESA S"
BELLA COOLA, BRITISH COLUMBIA
23 JUNE 1996

REPORT NUMBER M96W0109

The Transportation Safety Board of Canada (TSB) investigated this occurrence for the purpose of advancing transportation safety. It is not the function of the Board to assign fault or determine civil or criminal liability.

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SUMMARY

While the fishing vessel "THERESA S" was alongside in Bella Coola harbour undergoing engine repairs, there was an explosion and a fire in the engine compartment. As the fire spread, the three people who were in the wheel-house managed to escape to the outside deck. They suffered differing degrees of burns to the face and body, with two requiring hospitalization, one in an intensive care unit in Vancouver. The fire was extinguished by the local fire department.

Ce rapport est également disponible en français.

OTHER FACTUAL INFORMATION

Particulars of the vessel

Name	"THERESA S"
Small Vessel Licence Number	13K21303
Port of Issuance of Licence	Vancouver, B.C.
Flag	Canada
Gross Tonnage	Less than 15
Length	9.75m
Type	Gillnet Fishing Vessel
Built	1956
Propulsion	Gasoline Engine
Owner/Operator	Mr. Vernon Schooner Bella Bella, B.C.

The "THERESA S" is a small fishing vessel of wood construction with fibreglass over the carvel planked hull. The wheel-house is located forward, over the engine compartment, and there is a small sleeping cabin below deck in the bows. The upper works are constructed of marine plywood. Access to the engine compartment is gained by raising floorboards in the wheel-house. In the wheel-house, the steering position is on the port side forward and a seat is provided for the helmsman. A second seat is located on the starboard side forward. The galley stove and sink units are aft on the port side, abaft the steering position. The stove uses propane fuel and the propane bottle was stowed, with the shut-off valve closed, between the stove and the helmsman's seat. The bottle is connected to the stove piping by means of a flexible neoprene hose. On the starboard side of the cabin is a table with two built-in seats.

On 23 June 1996, the "THERESA S" was berthed at the floats in Bella Coola harbour, undergoing repairs to the main engine. There were three persons in the wheel-house, the owner, a mechanic and a friend of the owner. The owner was seated in the helmsman's seat and his friend was seated opposite him, while the mechanic was working on the main engine. The floorboards were lifted and the engine compartment was open to the wheel-house. The repairs involved removing the main engine electric starter motor and replacing the pinion gear. While this was being done the starter batteries, located in the forward end of the engine compartment, were disconnected.

Several months before this repair, the owner had removed a lighting system for the after deck. The power for this lighting system had been supplied directly from the starter batteries. The wiring was disconnected from the battery terminals and cut off approximately six feet from the terminal end. The cut length of the two-core wire was dropped into the bilge and left there.

Prior to the mechanic working on the engine, the owner had done a tune-up of the valve tappet clearances. To remove the valve cover and gain access to the tappets, the owner had first to remove the gasoline fuel pipe connecting the fuel lift pump and the carburettor. After the repairs the mechanic reinstalled the fuel pipe and primed the fuel system. Both the removal and the priming of the system allowed gasoline to drain into the engine compartment bilge, which already had about four inches of water in it.

When the mechanic had completed the repairs, he reconnected the battery terminals. While reconnecting the batteries he also found and connected the wire from the defunct lighting system, without asking the owner what

the wiring was for.

With the other end of the defunct wire lying in sea water in the bilge, a short circuit was created and the wire overheated with the result that the wire's insulation began to burn, exposing the hot copper core of the wire. When the gasoline fumes and the gasoline in the bilge ignited, an explosion followed immediately afterwards. Gasoline fumes had been noticeable in the wheel-house just prior to the explosion. At about 1550, when the mechanic asked the owner to start the main engine, the owner's friend had warned that he smelled gasoline.

The mechanic managed to get out onto the after deck through the door at the starboard after corner of the wheel-house. He suffered minor burns on the face while exiting but was protected from more serious injury by his coveralls. The owner opened the forward window on the port side and exited through it onto the deck, assisted by a fisherman from an adjacent boat. The owner suffered burns to his arms and hands. After trying, unsuccessfully, to kick out the starboard window, the owner's friend also got out through the port window. He was also helped out by the other fisherman, who used a bucket of water to put out his burning clothing. The friend suffered severe burns from his knees up to his head.

The ensuing fire severely damaged the wheel-house area and the electronic navigation equipment. There was little damage to the engine compartment and main engine. The fire was extinguished by the local Fire Department.

Inspection of the defunct lighting system wiring after the fire revealed that the ends that had been in the sea water in the bilge, were globular shaped, indicating that there had been enough heat in the wires to start the copper cores melting.

The owner was hospitalized at the local hospital, and the mechanic was treated as an out-patient. The owner's friend was airlifted to a Vancouver hospital for treatment that the local hospital could not provide, and he was in intensive care for several days.

ANALYSIS

Often, in small vessels, repair work is carried out by the owner and in many cases the owners are not qualified engine fitters or electricians. Consequently, repairs and maintenance are not always carried out in a professional manner and are not recorded in a maintenance record book. The mechanic did not know what the wires were for and did not verify their use with the owner before reconnecting them, but the wiring from the discontinued lighting system should have been removed in its entirety once it became redundant.

Both the removal and the priming of the fuel system allowed gasoline to drain into the engine compartment bilge. This was not taken into account by either the mechanic or the owner and no means of checking the bilge or ventilating it was used during or after the repairs.

The propane bottle for the galley stove was stowed inside the galley/wheel-house instead of in its normal position on deck. The bottle's shut-off valve was closed and, even though the flexible hose was damaged, no propane leaked to add fuel to the fire.

FINDINGS

1. A length of two-core electrical wire from a redundant circuit was left in the engine compartment bilge.

2. A mechanic retained to complete work on the main engine inadvertently reconnected the redundant wire to the starter batteries.

3. A closed circuit was caused by the bare cropped end of the redundant wire being in sea water in the bilge.

4. Gasoline had been spilled in the engine compartment bilge when the fuel supply pipe between the fuel lift pump and the carburettor was removed, and when the system was primed.

5. No measures were taken by those involved in the repair to monitor gasoline fumes or remove gasoline from the bilge.

6. The redundant electrical wire overheated, burnt off its insulation and ignited the gasoline fumes and the gasoline on top of the water in the bilge.

7. The accompanying explosion increased the severity and extent of the fire.

8. The raised wheel-house floorboards effectively cut off access to the after door for the two persons sitting in the forward seats.

CAUSES AND CONTRIBUTING FACTORS

Gasoline fumes and gasoline that had been spilt in the engine compartment bilges ignited when defunct electrical wiring, which had been inadvertently connected to the starter batteries, overheated after short circuiting in sea water in the bilge. The ensuing explosion resulted in extensive fire damage in the wheel-house.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson Benoît Bouchard, and members Maurice Harquail, Charles Simpson and W.A. Tadros, authorized the release of this report on 04 March 1998.