



MARINE SAFETY ALERT

Inspections and Compliance Directorate

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Safety Alert 03-02

HANDHELD STEERING SWITCHES

Recently, while transiting inbound to the Tampa Bay Ship Channel, a tug and barge combination carrying approximately 227,000 barrels of mixed petroleum products lost steerage and ran hard aground. The incident resulted in approximately \$225,000 dollars of property damage primarily associated with the barge's double bottom tanks.

The loss of steerage was caused by the failure of a hand-held non-follow up remote steering switch. These devices are routinely used throughout the towing industry and consist of a two-button switch mounted at the end of a small handle attached to an extendable wire. The wire is connected to the vessel's rudder control circuitry. By depressing either of the two buttons, the towing vessel operator is able to position the rudders and maintain desired steerage. This control is not the only steerage device available to the operator. However when used, it permits movement of the operator within the pilothouse area enabling him or her to ascertain side clearances while transiting narrow channels or during other periods of close maneuvering.



The steering switch is a Robertson Model F ½. The assembly contains four micro switches and consists of two pushbuttons which when depressed come in contact with a two sectioned plate. The depressed button causes one section of the plate to shift against the actuating tabs of two side-by-side micro switches. When this occurs, the steerage circuitry is activated and the rudders shift in the selected direction. As the button is released, the inherent resilience of the contact plate causes it to move off the actuating tabs of the micro switches thereby allowing the circuitry to return to normal.



During the casualty, the vessel operator was unable to change to another means of steering prior to the tug and tow running aground. Afterwards, an inspection of the steering switch revealed that one section of the plate fractured and lodged itself between the other section and the actuating tabs of the micro switches. Although the buttons were released, the broken section of the plate depressed the actuating tabs resulting in the continued hard right rudder positioning. The failure of the plate is most probably related to metal fatigue caused by long-term cyclic operation.

Following the incident, the tug's owners inspected six other

vessels of its fleet. Four vessels were discovered to have similar fractures in various stages on the plate. The manufacturer's equipment manuals were void of any preventative maintenance requirements and the vessel's operators did not have any routine scheduled maintenance plan to inspect or replace worn components of the switch.

Persons owning and operating vessels with Robertson hand-held steering switches and other similarly operating equipment are strongly encouraged to:

- Inspect the internal components of existing controls for signs of fatigue or fracturing.
- Establish a preventative maintenance procedure that complies with the manufacturer's recommendations.
- Ensure that equipment operators are knowledgeable in its usage, capable of inspecting its components and completely understand what immediate actions may be required when failure occurs.
- Consider the use of an electrical disconnect switch located at or near the cable's connection to the vessel's primary steerage circuitry. The use of a disconnect switch will permit isolation of the cable and hand held unit in the event either item fails. Disconnecting would enable operation of another steering method.

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