



MARINE SAFETY ALERT

Inspections and Compliance Directorate

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Surge Protective Devices Onboard Vessels

We've all seen them and used them. Surge protective devices (SPDs), more commonly known as surge protectors or power strips help protect our expensive electronic devices from being damaged from excessive currents and allow us to deliver power to multiple devices simultaneously. This safety alert addresses the use of certain electrical protection devices onboard vessels and the inherent risks they may cause. Most commercially available SPDs are designed for use ashore and will interrupt *only* the hot conductor when a surge occurs. What does that mean for the ship owner/operator? It means that while these devices may provide protection in our homes and offices, these same devices may be a fire risk onboard vessels.

A marine casualty investigation of two separate stateroom fires onboard a U.S. Flag Container ship revealed that the sources of the fires were attributed to the use of SPDs plugged into a lighting circuit. It was discovered that a ground had developed on another circuit that was connected to the same distribution panel providing power to the staterooms. This ground created an imbalance of voltage between the two power conductors supplying the SPDs which caused excessive currents, overheating, and subsequently, a fire. In this instance, even if the SPDs automatically tripped as designed, only one power conductor would have been secured while the other would continue to provide power, possibly shorting to the device's ground wire and the structure of the vessel.



For shipboard applications, it is critical for a device to interrupt both power conductors. Underwriters Lab Standard - UL Marine 1449 – addresses this issue and applies to the use of SPDs.

The Coast Guard **recommends** that vessel Owners, Operators, Class Society Surveyors, Insurers, and other inspection personnel examine the risks associated with the use of SPDs aboard their vessels, and if necessary ensure their organizations have policies and procedures relating to their use. Vessels should have defined procedures for checking the condition and grounding capabilities of personal/portable electrical equipment, and trained shipboard personnel should be assigned to check and approve all SPDs in use or brought on board for compatibility with the vessel's electrical distribution system prior to use. Routine checks of switchboard and distribution system 120 VAC ground detection systems are necessary to detect the presence of grounds that may cause similar circumstances with non-marine type SPDs. These recommendations are not mandated rather just an advisory based on lessons learned from the casualty.

This document is provided for informational purposes only and does not relieve any domestic or international safety, operational or material requirement. Developed by the Office of Investigations and Casualty Analysis, United States Coast Guard Headquarters, Washington, DC. Questions can be addressed to HQS-PF-fldr-G-PCA@uscg.mil.