

**U.S. COAST GUARD
MARINE SAFETY OFFICE PORTLAND, MAINE**

SAFETY ALERT

Use of PVC piping in vessel systems

A large Portland based trawler experienced a flooding casualty at sea while steaming towards Portland on February 5, 1997. The source of the flooding was a cracked 4" seacock valve housing, which was damaged upon impact when a marine battery fell from a storage area located approximately 15 feet above the seacock.

The PVC seacock was part of the vessel's main engine raw water cooling system that was constructed entirely of PVC components from the through hull fitting to the main engine.

In this incident the crew of the vessel was quickly alerted to the flooding condition by a properly installed and functioning high water alarm in the engine compartment. Upon investigating the reason of the high water alarm activation, vessel crew members observed the damaged seacock flooding from a crack between the valve and the vessel's hull, rendering the valve completely ineffective at stopping the incoming flow of water.

This incident points out the danger of using PVC pipe and piping system components in critical piping systems, especially water intake systems and pressurized piping systems. While PVC piping, valves, and other components can be considerably less expensive than steel pipe and piping components, PVC has considerably less strength and impact resistance than steel.

In this particular incident, the simple accident of a battery slipping from a storage area resulted in a situation where the vessel was in very real danger of sinking. While the storage of the battery in this instance was inadequate, the accidental shifting of objects should be considered possible at all times in heavy weather. The mechanical arrangement of a vessel should not be such that an adrift object creates a serious flooding condition that could result in a vessel sinking.

The Coast Guard specifically advises against the use of PVC components in vital systems, especially in sea water intake systems and pressurized piping systems.



The loss of this vessel was prevented by quick action of the crew, who controlled the flooding rate by applying a damage control patch consisting of clothing, oilskins, and net twine. Fishermen should have a damage control plan and materials onboard to respond to flooding conditions at sea.

This incident highlights the advantages of a properly operating bilge high water alarm system. High water alarms are required on certain fishing vessels, but are recommended on all fishing vessels. High water alarms should be installed using good electrical wiring practices and should be positioned to activate immediately above normal bilge levels. Early warning is imperative to a proper response to a flooding condition at sea.

For further information on this Safety Alert contact:

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