UNITED STATES COAST GUARD
U.S. Department of Homeland Security

MARINE SAFETY ALERT

Assistant Commandant for Marine Safety, Security and Stewardship

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High Velocity Vent Valves, Vacuum Valves, P/V Valves

Simple to check, easy to maintain, don't let them be a problem again.

A recent marine casualty resulted in significant damage to tank structures, piping and components of a combination chemical / oil product carrier. Vessel-to-vessel loading operations were taking place at anchorage and one tank became over-pressurized. Subsequently, three cargo tanks and three ballast tanks on the ship suffered catastrophic structural failures that allowed hazardous cargo to migrate throughout those areas. This incident caused the vessel to list and created a very dangerous explosion hazard requiring costly and time-consuming lightering and repair operations. Additionally, it presented a hazard to the port and persons involved.

The investigation is nearly complete and investigators have identified several causal factors, one being the failure of the high velocity vent valve which did not open and prevent over pressurization of the tank while it was being filled.

The high velocity vent valve is part of the pressure / vacuum protection piping of the cargo tank. It prevents damage to cargo tanks by normally staying closed and only opening at a preset positive pressure. Large shipboard tanks can be easily damaged by relatively low pressures. Use of these valves minimizes such occurrences. Other benefits of the valve being in a closed position is that breathing of the tank is minimized thus preventing unwanted cargo vapor releases into the atmosphere, protecting the environment and limiting the loss of cargo due to vaporization. The valves are also equipped with flame screens to prevent explosions due to ignition. The vacuum breaker component of pressure / vacuum protection piping of the cargo tank similarly protects the tank by preventing excessive vacuum from being formed.

After this specific casualty, the high velocity vent valve of the tank being filled was found stuck closed and inoperable using the manual test lever. A valve for another tank was also found stuck. Scientific testing of the substance between the stuck valve disc and the seating surfaces indicated the presence of oxidized vegetable oil or fat likely from previous cargos. It appears doubtful that crewmembers exercised the valves prior to their cargo operations as per their operating procedure.

As a result of this casualty and others involving similar circumstances, the Coast Guard **strongly recommends** to vessel Owner / Operators, Crewmembers, Classification Society Inspectors, Vetting, and other inspection personal ensure that tank high velocity vent valves and vacuum valves, or combination pressure / vacuum valves are maintained in operating conditions at all times and are routinely checked as procedures require.