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Alaska Small Passenger Vessel Safety Alert No. 02-2003

Carbon Monoxide Poisoning on a Passenger Vessel

Background: Safety Alerts are meant to provide timely safety-related information to mariners of "Lessons Learned" from marine casualties. The information provided is part of an ongoing effort to apply Prevention Through People (PTP) principles to improve maritime safety.

Incident: A 30-foot passenger vessel, after experiencing starboard engine difficulties, returned to port at a slow speed on the remaining port engine. On the return voyage, the passengers started showing signs of carbon monoxide (CO) poisoning. The master immediately called 911 for an ambulance and opened another window to increase the accommodation space ventilation. All passengers were taken to the hospital for evaluation and treated with oxygen. After 30 minutes on oxygen some passengers still had CO levels of up to 25%, in excess of the normal 0-1% level.

Lessons Learned: The Coast Guard investigation identified several lessons learned from this incident.

1. Slow speeds can increase the likelihood of back drafting of engine exhaust.
2. The increased trim angle or high bow angle caused by slow speed and lack of hull planing can increase the back draft effect and subsequent CO levels present on vessels.
3. Openings in rear doors may allow for entry of CO gas into passenger spaces from the results of back drafting. Opening and closing hatches, doors, and windows may raise or lower CO levels on board vessels. When airflow is moving forward inside the vessel, CO may be entering the vessel
4. Efficient engine performance is vital to minimizing CO production. Contaminated fuel, dirty or clogged flame arrestors, incorrect idle mixture adjustment, dirty/worn injectors, fouled/worn spark plugs, incorrect timing, worn rings and valves, and low engine operating temperatures are among some of the engine systems that can contribute to increased CO levels.
5. Vessel operators must pay attention to prevailing conditions and provide for ventilation to induce fresh air and minimize exhaust re-entry.
6. In order to minimize CO buildup, do not warm up or run propulsion engines for extended periods while the vessel is stationary.
7. Carbon Monoxide detectors if installed correctly and maintained can give early warning of increased CO levels on vessels.