



UNITED STATES COAST GUARD

U.S. Department of Homeland Security

MARINE SAFETY ALERT

Inspections and Compliance Directorate

November 12, 2014
Washington, DC

Safety Alert 15-14

ACCIDENTAL RELEASE OF CO₂ SYSTEM! IMPORTANCE OF DESIGN AND TESTING OF EMERGENCY SYSTEM CONTROLS

This safety alert serves to remind shoreside and vessel personnel of the importance of 1) designing and maintaining emergency systems to be logical and easily operated in high stress situations, 2) maintaining a high level of crew familiarity with emergency systems, and 3) exercising safeguards during testing to mitigate the risk of human error or system malfunction. Although regulations prescribe standards for safety systems aboard vessels, installations particularly those onboard uninspected vessels, can vary dramatically.

During a recent Uninspected Towing Vessel (UTV) exam, a vessel crewmember intending to test the fuel oil shut-off cables instead pulled the CO₂ system release cables. As seen in photos directly below and at the end of this safety alert, the emergency control panel used during the incident contained pull cables for both the CO₂ system and fuel oil shut-offs.

Accidental releases are not uncommon and vessel crewmember and Coast Guard inspector fatalities have occurred in the past. Fortunately, in this instance the audible alarm system and release time delay functioned as intended, allowing all personnel to safely evacuate the machinery spaces prior to discharge.



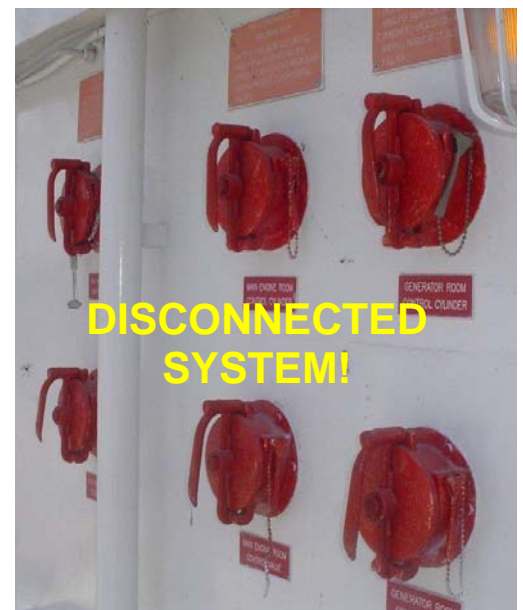
Poor design characteristics:

Similar activation pulls were collocated for fuel and CO₂ systems. Fuel oil shut down signage was located on the left, but fuel oil pulls were located on the far right with three CO₂ pulls in between.



In a separate recent UTV examination, an inspector found two sets of remote emergency shutdowns with only one set operational. The original station (see image on the right) appears to be fully operational, but was not connected. The operational shutdowns were at a separate location.

Crew interactions with emergency systems often occur during periods of increased stress (e.g., a compliance exam, drill, or an actual emergency). System design, proper human engineering, labeling, and detailed training will substantially reduce the risk of human error.



The Coast Guard **recommends** conducting a comprehensive pre-test meeting and simulated step-by-step “walk-through” between involved parties prior to actual testing of complex or potentially confusing systems. Operational controls should be implemented to maximize safety and reduce risk.

Furthermore, the Coast Guard **strongly reminds** all maritime operators of the importance in performing regular vessel specific emergency drills and to ensure that all crewmembers have the proper knowledge, skills, and abilities to respond to any potential emergency.

UTV regulations in 46 Code of Federal Regulations (CFR) 27.209 require all crewmembers to be familiar with the location and operation of engine room fuel-shutoffs and fire extinguishing equipment. All credentialed mariners are required by 46 CFR 15.405 to be familiar with firefighting and lifesaving equipment. Additionally, Coast Guard guidance on CO₂ system safety and is available at:

<http://www.uscg.mil/hq/cg5/nvic/2000s.asp#2000> .

Remember:

- Emergency systems should be designed with human factors in mind - logically understood and easily operated during high stress situations.
- System training will provide the familiarity needed during an emergency.
- Pre-test coordination and review of procedures will minimize accidental and potentially fatal discharges.

This safety alert is provided for informational purpose only and does not relieve any domestic or international safety, operational or material requirements. It was developed by the Coast Guard Towing Vessel Center of Expertise and Office of Investigations and Casualty Analysis. For questions or concerns please visit the Towing Vessel National Center of Expertise web site (www.uscg.mil/TVNCOE) and click on the “About Us” tab under TVNCOE Home for contact information or send an e-mail to the Office of Investigations and Casualty Analysis at: hqs-pf-fldr-cg-inv@uscg.mil.

CO₂ pulls:

- To main engine manifold - Top Left
- To main engine room - Center
- To generator room manifold - Bottom Left

Fuel Oil valve stops:

- To main engines - Top Right
- To generators - Bottom Right

