Fleet *Memorandum*

TDI Brooks

(Post for Public Review and next to Engineer's Standing Orders)

Fleet Memo #15: Fuel Tank Sight Gauges

Our Policy

It is our policy that all sight glass valves will remain closed except during a reading of the tank level, and that all valves will be labeled to that effect. Most of the vessels already have the signs in place. The only exception will be expansion tanks on engine cooling.

The Regulatory Requirement

Almost a year ago a deficiency was noted in our USCG inspection that the valves on all sight glasses need to remain closed unless a reading is being taken (meaning at that time, not "during that watch"). If this cannot be achieved, then the valves need to be replaced with auto-closing valves.

Action Required on each vessel

1. Place and maintain signs that state - "Keep Closed Except When Reading" at each sight glass valve.
2. Include at written statement to that effect in the Engineers' Standing Orders, to be acknowledged by engine room watch when joining.
3. Include checking these valves in your engine room rounds.
4. Post this fleet memo near the Engineer's standing orders and on the vessel's notice board.

Reason for Shutting Valves

So what is the problem, why shut the valve off? The problem is that in the event of a fire, the tubing will melt away and the fuel in the diesel (or lube oil) will spill out and further fuel the fire. Also, while working in the space, the tubing can be knocked off accidentally and the fuel will drain into the space, being a source for a fire.

Other Than Fuel Tanks

We have already had a sight glass or valve fail in our potable water tank on one vessel and flood the accommodations and food pantry.

If a glass or valve fails on the used oil or slop tanks and drains to the engine room bilge it creates a terrific mess and the work of the oily water separator must be repeated.

Example of valve left open (Loss of Life and of Vessel)

The following is example is taken from the incident investigation of a fire on board a fishing vessel in Alaska.

Leak from Day Tanks: The day tanks were constructed using welded steel. The sight glasses on the tanks were Pyrex glass and were equipped with spring loaded check valves designed to stop the flow of the fuel should the sight glass fail. In addition, the sight glasses were protected by steel angle iron on both sides of the sight glass. There were no alarms or gauges installed on the day tanks to alert the crew of a leak from the day tank. If the sight glass was broken and the stop valve failed, or if there was a fracture or hole in the day tank, it is possible that liquid fuel could have leaked from the day tank.

It was determined that a leak from a sheared off fitting for the sight glass could allow fuel to escape at a rate of 4 – 16 gallons per minute depending on the size of the hole left in the fuel tank. Liquid diesel fuel is difficult to ignite because it possesses a high ignition temperature. Thus, any possible fuel leak coming from the day tanks would have to come into contact with a sufficiently hot surface to atomize and ignite the fuel. The distance to the nearest heated surface, the MDEs, was approximately 6-8 feet away. Given the engine room's arrangement, the fuel most likely would have drained into the bilge instead of igniting on the MDEs.

Also problematic with this scenario is that it does not explain the loss of electrical power in the minutes prior to the explosion. Based upon this analysis, a leak from either day tank could have provided the amount of fuel necessary to cause the explosion. However, given the levels of protection afforded to the sight glasses, the unlikelihood that the fuel would have been released under sufficient pressure to atomize the fuel, the lack of sufficient heat sources between the day tanks and the vessel's bilge, and the lack of consistency with the observations of the crew, this scenario is considered to be a "possible" source of the initial smoke and fire.