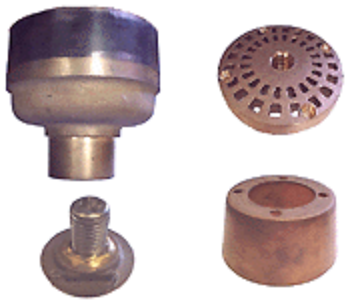
ROUTINE MAINTENANCE MISHAPS
"DECK DRAIN H_2S DANGERS"

This will show you how maintenance to piping systems can go wrong and the Lessons Learned by these incidents

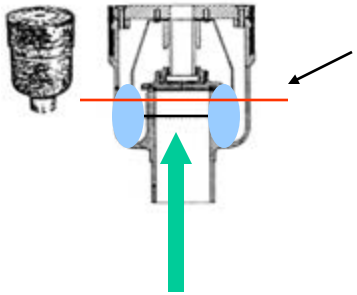


Overview

- R-Division personnel were investigating deck drains in and around the scullery due to a trouble call report of incorrect assembly and emitting a “smell”. The deck drain was being fed by 3 pipes. One draining from the dishwasher and 2 from unidentified systems.
- While removing the piping unions to allow a visual inspection to the deck drain, the ship took a roll creating a “wind” effect which released Hydrogen Sulfide (H_2S) gas from the deck drain piping.
- H_2S gas release of 27 PPM caused the sailor to be temporarily overcome and requiring assistance to evacuate the space.

BACKGROUND

- A request for assistance was submitted due to a smell coming from the deck drains in the scullery and surrounding area.
- The drains were found to be missing vital pieces to the drain assembly. The bell on one drain in the passageway and the whole strainer, bell and valve assembly to the one in the scullery.
- The bell allows the drain to make a vapor barrier between the pipe and the strainer. It creates this barrier using water the same as a peat trap utilizes in a urinal.



Gasses and vapors become trapped

At this line is where a Vapor Barrier is created between the Bell and Pipe. Even if the valve is open, using water as the trapping agent no gasses or vapors can escape.

BACKGROUND

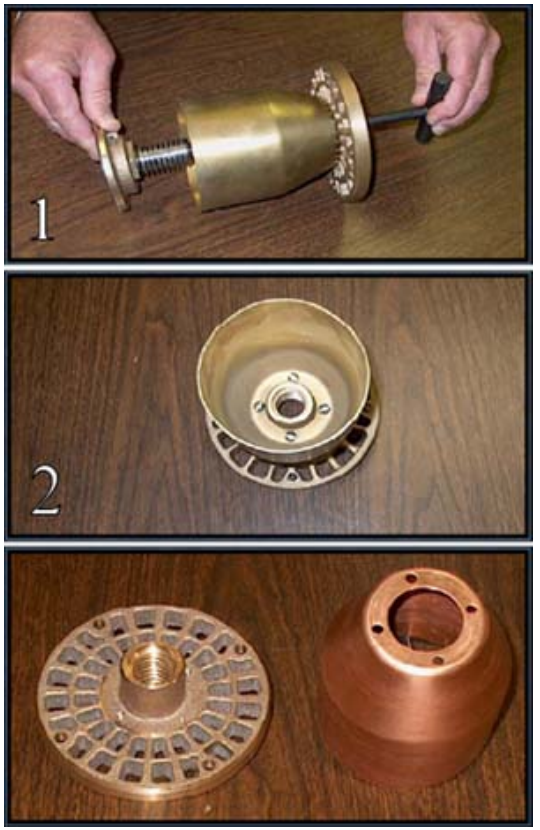
- The galley personnel noticed a smell coming from the passageway that alarmed the individuals. They request assistance from Repair Division to investigate.
- Repair Division personnel noticed that the bell was removed from the deck drain strainer located in the passageway and sitting next to the strainer.
- It had been removed by the galley personnel to allow faster drainage.
- An inspection at the deck drain using a gas analyzer indicated 6 PPM H_2S (PEL is 10 PPM IAW NSTM 074Vol3).
- The bell was reinstalled correctly and the gas reading returned to 0 PPM with no smell.

BACKGROUND

- The next drain to investigate was in the scullery.
- The deck drain was located within the sump which sits between the dishwasher and the garbage grinder.
- The deck drain had the strainer installed but with no bell.
- Three pipes were routed to the drain with each having a union attached to allow maintenance to the deck drain.
- During removal of the unions the ship took a roll and a “wind” was released from the drain assembly.
- This caused the repairman to become incapacitated by a large amount of H_2S gas. Scullery workers assisted the sailor to a fresh air environment and contacted the Corpsman.
- The deck drain was tested with a gas analyzer and found to be reading 27 PPM H_2S (almost 3 times PEL).

BACKGROUND

- The scullery was evacuated and ventilated.
- The repairman suffered no long-term effect and returned to full duty with no lost work days.



Final Thoughts

- Various reasons can cause this “wind” effect.
- A faulty check valve between the drains and the tank.
- The location or deterioration of the main deck CHT piping vent line.
- Aeration system to tank is inoperative or secured.
- Always refer to your NSTM 079V3 (Afloat gas Free Engineering), NSTM 593 (Pollution Control) and don’t forget the SDOSS.
- If someone reports a smell treat it as though it were a toxic gas situation.
- Always have on hand supervision, proper PPE, testing equipment and portable ventilation.

Final Thoughts

- One of the last items we think about causing personal injury onboard a ship is probably a deck drain.
- PMS is expected to be accomplished on these drains by trained DCPO's or DC Maintenance Men.
- The vast majority of these individuals are non CHT worker qualified.
- Deck drains are designed to allow water flow but also to trap gasses that can be emitted from the waste drain piping systems.
- This is an inherent hazard of drains located on the DC deck and below that even though categorized as a gravity drain they are required to tie into the waste drain piping system.