

CASE STUDY

BUNKER SLUDGE

Safety, Knowledge and Experience – The GFL Advantage



Situation

Cruise ships process fuel through fuel oil purifiers prior to use in the engines. Depending on the quality of the fuel, 1% - 4% will be discharged into the sludge tank. In addition to the fuel oil contaminants, contaminants from the lube oil purifiers and recovered oil/contaminants from the bilge water treatment system can also be discharged into the sludge tank. The sludge tank also serves as a “catch all” for various small volume wastes generated by regular engine room operations. As GFL Environmental owns and operates our own oily wastewater treatment facility, we observed that the quality of the sludge often varied markedly from ship to ship. Some bunker sludge could be treated fairly easily while others were exceedingly difficult. The primary problem was the difficulty in separating oil from water. Bunker sludge presenting a “tight emulsion” required considerably longer time to break.

Cost Saving Services

We approached one of our cruise partners with a proposal. If the cruise line provided accommodation, GFL would send qualified personnel onboard to research what wastes were diverted to the sludge tank. The cruise line agreed, and our Sr. Marine Services Manager spent a total of eight days on two separate ships. The cruise lines keep meticulous records of all internal liquid waste transfers. The ships provided full access to the oil record books

and the engineers answered all the questions asked. The purpose of the study was to see if there were any waste streams that would cause the problematic “tight emulsions”. If these waste streams could be segregated from the sludge tank, the benefit to the ship could be a reduced price for processing sludge.

Results

After all the data was gathered, GFL researched the various chemicals and waste streams introduced into the sludge tank. It was found that the two subject ships used a particular type of bilge water treatment system that required the addition of a flocking agent. This chemical agent helped bind the contaminants so they could be separated from the water. The clean water was then suitable for discharge overboard. Periodically the contaminants were discharged into the sludge tank. The problem was that the contaminants still contained the active chemical agent. The agent then reacted with the contents of the sludge tank creating the “tight emulsion”. Subsequently, the ships constructed a separate tank for the collection of the bilge water treatment system residuals. The quality of the sludge improved and, over a number of years, a few of the ships in the fleet were able to discharge sludge of a higher quality. For some of these ships, depending on the market, the sludge became a commodity instead of a cost item.