Monitoring Hydrocarbons in Bilge Water

The Situation

Various processes onboard ships, such as machinery wash-down, maintenance, and leakage, generate oily wastewater. This contaminated water flow collects in the bilge of the ship. Marine diesel, lubricating oils, grease, as well as other contaminants may be present in bilge water. The bilge water is discharged overboard, with oil and grease concentrations in the discharged water limited by national and international regulations.

In the United States territorial waters, the U.S. Coast Guard (USCG) limits the discharge of oil in bilge water to 15 ppm. The USCG further limits bilge water and oily discharges that cause a visible sheen on the water. Bilge water discharges in international waters are limited to 15 ppm by the International Maritime Organization (IMO). Ship operators who violate the discharge limits are subject to large fines by the jurisdictional authority as well as possible criminal prosecution of responsible personnel. Recently, cruise ship lines and cargo ships have incurred record fines for discharge violations.

Problem

The maritime industry needs an effective and accurate analyzer to monitor the oil concentration in the bilge water before discharge. Online analyzers manufactured by several companies have been employed for this application, yet to date, none of these analyzers have been effective or accurate, despite being certified monitors.

Most analyzers monitor oil in water by using a contact flow cell through which the bilge water flows. The flow cell is regularly fouled by oil and other material. Even mechanical wipers cannot keep the flow cell free of fouling. Most monitors require considerable maintenance for proper operation or measure the oil concentration indirectly by turbidity, which is subject to interference by solid material present in bilge water.

Solution

TD-4100 series monitors eliminate the problems associated with other bilge water monitors. The TD-4100XD uses a non-fouling, non-contact flow cell to monitor the hydrocarbon concentration by fluorescence, which is directly proportional to the oil concentration. The flow cell eliminates contact between the water and optical windows, thereby preventing fouling. TD-4100XD measurements can be verified with a CheckPOINT™ solid standard. Bilge water monitors require certification. The TD-4100XD is certified by the USCG as an Oil Content Meter/15 ppm bilge alarm according to IMO 107(49). The alarm relays can activate discharge control devices and/or alert operators.