

Ship Borne BART testing

Quick Break Training

12 March 2009

Ships have two major internal bacteriologically influenced problems with water that can affect ongoing operations. These problems relate to the potable water supplies for any crews and passengers, and also the bilge waters that collect between hulls and/or keel plates. BART testers can be used to determine the extent and risks that can be associated with the risks that can be generated from too high a level of bacterial activity. To address these two problems, it is recommended that the following three BART testers be employed to test the activity of: (1) general HAB bacteria using the HAB-BART; (2) sulfate reducing bacteria using the SRB-BART; and (3) acid producing bacteria using the APB-BART. While the HAB-BART tester will detect unacceptably high levels of bacteria in potable waters, the SRB- and APB- BART testers both monitor bilge waters for potential corrosion. To conduct each of these tests then 15ml of the sampled water needs to be added to tester following recommended procedures. Once set up the testers are left at room temperature in a BART rack to control the risk of spillage during normal ship motions. It is recommended that the more economical LAB-BART rack be used which will hold six lab testers. This rack may be held down to prevent movement when tests are underway. The normal ship motion has been found not to significantly affect the BART testing process.

Reading the BART testers is very simple. For the HAB-BART tester the sample solution is blue at the start of the test. If the blue disappears from the bottom up (UP reaction) then aerobic bacteria dominate and there is a lot of oxygen in the sampled water. If the blue disappears from the top down then there is strong likelihood that the bacterial activity could be supporting corrosive reductive events within the water. Here the population activity is directly linked to the delay before a reaction is seen. The longer the time lapse then it may be linked to the smaller the active population of general HAB bacteria. Time lapses are usually measured in days and for potable water supplies the blue color should stay for at least four days (preferably six). If the blue color reacts out in less than two days for a potable water supply then disinfection of the water should be a considered option. Where bilge water is being tested with the HAB-BART it can be expected that larger bacterial populations will be active. The occurrence of a down reaction in the tester could be taken as a warning sign that corrosive processes are under way in the sampled bilge. Generally for bilge waters a time lapse of less than two days may be considered significant particularly with a down (DO) reaction. Refer to the data from the other two BART tester types for clarification of the corrosion risk in the bilges.

The SRB-BART tester determines the risk of pitting and perforation of the steels. There are two reactions that can occur: (1) blackening around the BART ball called a BT reaction; and (2) blackening in the conical base of the tester called a BB reaction. BT links to widespread pitting and BB links more to perforation of the steels. For the APB-BART test there is only one reaction which is a dirty yellow (DY) color that relates to the formation of organic acids that can aid in the pitting of the steels. Time lapses are significant with less than 5 days for an SRB- and 3 days for the APB- BART indicating a significant corrosion risk in the bilges.

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