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Test to Determine the Potential Corrosion Effects of Ballast Water Treatment Systems on Ballast Tanks Coating and Other Materials

ABSTRACT

Ballast water carried by ships keeps them upright during loading and offloading operations and provides balance, stability, and trim during sailing. Because ballast water is loaded from the surrounding port or coastal waters, organisms in the ballast water sometimes establish populations resulting in biological invasions, which may have severe ecological or economic impacts. This standard is designed to test the effect of long-term accelerated exposure of treated water on coating systems.

KEYWORDS

Marine, Ballast, Regulation D-2, MEPC 59/2/16, BWTS, Coating, MSC.215(82), PSPC, TG 452, STG 44

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Foreword

In NACE standards, the terms "shall," "must," "should," and "may" are used in accordance with the definitions of these terms in the NACE Publications Style Manual. The terms "shall" and "must" are used to state a requirement, and are considered mandatory. The term "should" is used to state something good and is recommended, but is not considered mandatory. The term "may" is used to state something considered optional.

Ballast water is carried by ships to control trim, draft, stability, or excessive stresses on the ship structure. Ballast water is typically carried in dedicated ballast water tanks located around cargo tanks/holds, in forepeak and aft peak tanks located near the bow and the stern of the ship. Because ballast water is taken on board from the surrounding port or coastal waters, it can contain a diverse assembly of marine life. When released into a new port, organisms in the ballast water can sometimes establish non-native populations, altering the local biosystem, becoming "biological invasions." Some biological invasions, commonly known as invasive aquatic species (IAS), have been determined to have a significant adverse impact to many of the world's coastal regions.

The majority of the current administration type approved ballast water treatment technologies developed to satisfy Regulation D-2 of the International Convention for the Control and Management of Ship's Ballast Water and Sediments (MEPC 59/2/16)[1] make use of active substances. These substances may, depending on the substance, concentration, and exposure duration, have an adverse effect on the ballast tank coatings, ballast piping system, and/or anodes within the tank.

Within the Ballast Water Management Convention which entered into force on 8 September 2017 mandates the installation and use of ballast water treatment systems (BWTS) to remove alien organisms from the ballast water. While the Convention does not specifically state that these BWTS should not affect the corrosion resistance, it does state that the system installed should be compatible with other shipboard systems i.e. coating systems, ballast piping system, or anodes in the tanks. Ship owners, builders, and insurers have expressed the need for such confirmation. Currently there is no independent information or test method to prove that there is no detrimental effect on the coating and other materials used within the ballast tank.

The coatings applied today within ballast tanks are required to conform to the IMO[(1)] Resolution MSC.215(82), "Performance Standard for Protective Coatings for Dedicated Seawater Ballast Tanks in All Types of Ships and Double-Side Skin Spaces of Bulk Carriers" (PSPC/WBT/BWT).[2]

This standard is intended for use by shipbuilding companies, shipping companies, ship personnel, coating companies, cathodic protection (CP) service providers, and ballast water treatment (BWT) suppliers to help prevent corrosion in ballast water tanks. Approval to this test method does not guarantee that a Ballast Water Treatment System will not affect a ballast tank coating in situ.

This standard has been prepared by NACE Task Group (TG) 452, "Testing of Coating Suitability, Anode Consumption, and Corrosion Evaluation with Use of BWT Systems," which is administered by Specific Technology Group (STG) 44, "Marine Corrosion: Ships and Structures," and sponsored by STG 03, "Coatings and Linings, Protective: Immersion and Buried Service," and STG 05, "Cathodic/Anodic Protection." It is issued by NACE under the auspices of STG 44.

(1) International Maritime Organization (IMO), 4 Albert Embankment, London SE1 7SR, United Kingdom

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