

STUDY OF CHEMICAL AND MICROBIAL FACTORS AFFECTING THE CORROSION IN BALLAST TANKS ON BOARD OF MERCHANT NAVY VESSELS

De Baere Kris¹, Helen Verstraelen¹, Raf Dewil² and Geert Potters³

¹ Hogere Zeevaartschool Antwerpen, Noordkasteel oost 6, 2030 Antwerpen
E-mail: kris.de.baere@hzs.be

² De Nayer Instituut, J. De Nayerlaan 5, 2860 Sint Katelijne Waver

³ Departement Bio-ingenieurswetenschappen, Universiteit Antwerpen, Middelheimcampus, Groenenborgerlaan 171, 2020 Antwerpen

In 2008, the Antwerp Maritime Academy together with the University of Antwerp started a BOF project aiming to establish the driving forces behind corrosion in ballast tanks of merchant navy vessels.

During a period of two years, the researchers did *in situ* inspections in more than 100 ballast tanks. The tank condition was compared with international accepted standards. These standards were too complex to allow statistical interpretation. An own index was developed, quantifying corrosion with only one figure. Pictures of the tank structure and samples of mud and rust were taken. These samples were then chemically and microbiologically analysed at the University of Antwerp.

The methodology of the research technique was published in the October and November numbers of 'Materials Performance', a NACE publication.

The project has reached the final phase where conclusions can be drawn. We were able to establish a general corrosion model showing the function between age and corrosion. A number of other correlations surfaced, such as the relation between corrosion and trading area, land of construction, ballast frequency, ship's type and coating type

Particularly interesting are the graphs concerning the effect of sacrificial anodes in relation to the ballast pattern.

Traditionally zinc anodes are considered as the best way to fight corrosion in ballast spaces after coating failure. We proved this thesis to be a myth for the majority of the tanks.

One of the results of this study will be a clear message to the ship-owners. The use of an improved coating system is to be preferred above the use of sacrificial anodes.