

Abstract

Fawzy F. Dekinesh

The Challenges and the Opportunities of Anti-Fouling Systems

ABSTRACT Title of Dissertation The Challenges and the Opportunities of Anti-Fouling Systems Degree: Master of Science The dissertation examines two main key issues related to climate change and biological pollution. The need for new innovative antifouling systems to fulfil future demand and the impact of biofouling on the ship's hull from both economic benefit and the environment benefit. The study of literature reviews shows the varieties of anti-fouling paints under two main mechanisms namely, SPCs and FRCs which are developed after TBT ban in 2001, put more pressure on shipping companies while looking for the most efficient anti-fouling systems as well pressure on paint manufacturers to develop an efficient alternative to TBT-based paint. The author intended to answer the research question by identify the gap between the current anti-fouling system and optimum anti-fouling systems through SWOT analysis the result of this analysis gives the required characteristics for future solution. Moreover, the author investigates the potential of saving energy through anti-fouling system by adopting Monte Carlo methodology and process the data through crystal ball the result shows that the antifouling system is a key element and is a part of an integrated system for maximizing energy efficiency. The author also introduces a methodology to guide the shipping company on the Selection of the most efficient anti-fouling systems among different systems through cost and benefit analysis the result shows the increased of operating cost due fouling. Although there are several types of anti-fouling paints and hull cleaning practices as result of AFS convention there is gap between current antifouling systems and optimum anti-fouling systems, which require all stakeholders namely IMO, shipping companies and paint manufacturer to share their goals and objectives to achieve a sustainable anti-fouling systems solution, maximizing energy efficiency and reducing of GHG as a part of marine industry commitments towards initial GHG strategy adopted recently by IMO in April 2018. KEYWORDS: GHG, Ant-Fouling Systems, Future Demand, AFS Convention, Maximizing Energy Efficiency, Economic Benefit, Environment Benefit, Sustainable Anti- Fouling Systems