

Autonomous Ships from the Perspective of Operation and Maintenance

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BACKGROUND

This project focuses on identifying the opportunities and challenges that on-board maintenance and practical operation of vessels poses in the development of autonomous ships. Inspired by the rapid development of autonomous vehicles considerable effort and interest is now invested in the development of autonomous ships. So far however, most of the research has focused on the legal aspect of unmanned vessels and on developing a system enabling a vessel to operate within the maritime collision regulation without human interaction.

This Ph.D. study is planned in cooperation between Svendborg International Maritime Academy (SIMAC) and SDU. The project has been generously funded by the Danish Maritime Fund, Lauritzen Fonden and A/S D/S Orient's Fond.

PROJECT OVERVIEW

Unlike in road transport where the driver is almost entirely occupied with driving the vehicle only a small portion of the workload on board most ships is devoted to the navigation. Much of the work of the crew is dedicated to maintenance and practical operation of the vessel.

The aim of this project is to investigate how and to what extend this workload can be handled on autonomous ships without a crew on board and how it can be expected to affect the vessels operation.

To be able to operate vessels autonomously they will need a high degree of automation and redundancy of machinery. How this affects the cost, reliability and utilization rate of the vessels will be investigated.

Besides reducing operational costs increased productivity is a major interest in the development of autonomous ships. Vessels are often inoperable with loss in revenue as a result. This project will by case studies of different vessels investigate if and to what extend automation can be expected to improve on the vessels productivity.

The focus areas of the project and how they intersect is visualized in figure 1.

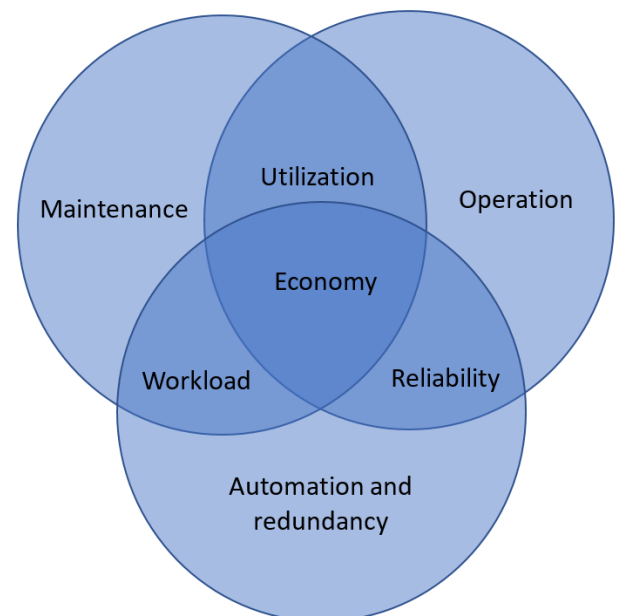


Figure 1: Focus areas of the project

RESEARCH QUESTIONS

- How is autonomous technology going to affect the workload required for operating and maintaining modern cargo vessels?
- How is autonomous technology going to affect the operational patterns of the vessels?
- How is autonomous technology going to affect the reliability and utilization rate of the vessels?

