

Background

Introducing autonomy in the maritime industry is to a large degree seen as a technology challenge. Even though autonomy imply that it will be less humans on the vessels, it is still a need for the human to control the operations from a remote location.

Challenge to be investigated:

An isolated focus on components and technology will fail to identify the safety of the system and collaborating systems

Autonomy in the maritime industry is therefore a complex socio-technical challenge that need to be understood in a system perspective.

Research goal and objectives:

The main research question for the project is *“which maritime systems will interact in a future with incremental autonomy, and how can we evaluate the effects of change to these systems?”*

Research Questions

1. How can concept of authority in the navigation function be linked with the taxonomy of autonomy?
2. Will using a human centred process to model to simulate future systems support the identification of interconnections and interactions in the joint systems, and will it support the measuring of system attributes and objectives?
3. How will changes in authority affect the governmental system performance related to own system objectives and the system-of-system objectives?

Industrial goals

The industrial benefits of the project will be:

- Save time and cost for developing future maritime systems with autonomous solutions since changes will be done in an early phase of the development
- By creating a system language the designers, manufacturers, ship owners and regulators could discuss concepts in a unified way
- The system perspective discover and eliminate potential system failures in the design phase and increase the probability for designing systems that are as safe or safer than existing solutions

Research methods

The project will combine Systems Engineering and Human-Centred Design to include stakeholders and operators to design future systems to meet the challenges and benefits of autonomy.

Simulators will be used to identify interactions within and between systems. Simulators will also be used to test and improve concepts and interactions between and within maritime systems.

Supervisors

- Hans Petter Hildre (hans.p.hildre@ntnu.no)
- Margareta H. Lützhöft (mhl@hvl.no)
- Runar Ostnes (runar.ostnes@ntnu.no)