

Autonomous Vessel Technology as a Means to Reach MOL's Goals

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1. Introduction

“Autonomous” became buzzword in automobile industry and is becoming buzzword in shipping industry these days. Different entities are coming into the area with different thoughts but, MOL, our company's purpose is quite simple. “Enhancing safe navigation level” and “reducing workload of seafarers” are our reason to develop and install those technologies. Those are goals to be kept pursuing, not new for us.

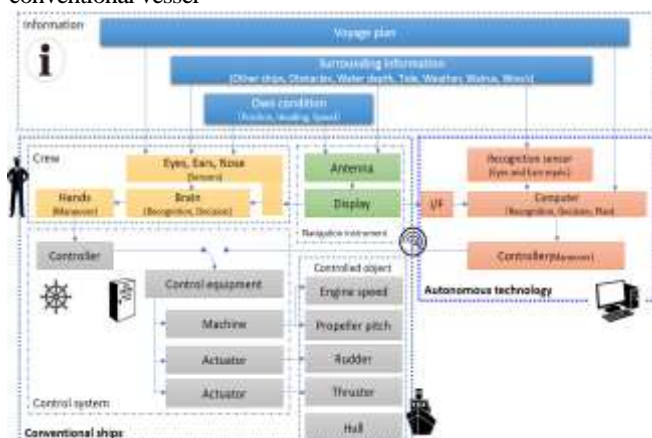
Having said that, not a few technologies are new for shipping company for shipping industry. Everyone is groping one's way. We are no exception. Through various experiences we gradually understand what we can do now what will be come true near future and what will be take more time for the development and field deployment.

I will share what the insight through many experiences including some filed tests.

2. Basic Structure of Autonomous Vessel

Autonomous vessels are required functions which seafarer has. We can categories roughly as “recognition”, “assessment”, “planning” and “controlling”. Many technologies are contained in each category and each of them need to be linked and be interactive.

Table 1 Differences between autonomous vessel and conventional vessel



3. Key Experiences

- Demonstration of Auto Berthing & Un-berthing System
- Sea Trial of Autonomous Sailing on a Commercial

These demonstrations were carried out by existing domestic car ferry and container vessel by installing related autonomous systems with many system engineers on board in case something is happened.



Fig.1 Big car ferry “Sunflower Shiretoko”

4. Results from Those Experiences

Each trail was succeeded without any navigational accident even certain voyage was facing very wild weather.

<https://www.mol.co.jp/en/pr/2021/21043.html>

<https://www.mol.co.jp/en/pr/2022/22007.html>

<https://www.mol.co.jp/en/pr/2022/22017.html>

5. Conclusions and Hurdles to Be Overcome

Through those experiences, we got many insights, the part to be improved, technology we have not developed, hurdles to be overcome. Following areas are to be focused and be tackled hereafter.

- A) Sensing
 - image detection
 - sensor fusion
 - new sensor
- B) Planning
 - making route considered the sense of seafarer
 - making route tool into account of navigation rules
- C) Operation
 - timing of decision making
 - auto tuning for disturbance
- D) Communication
 - between and among vessels
 - between vessel and VTS
 - between other shoreside people (operator, supplier, receiver, PSC...)



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