massterly
a Kongsberg Wilhelmsen joint venture

Operation of autonomous and remote controlled vessels

NFEA - Avanserte fartøy 2026

The start

- Yara Birkeland
- Agreement in 2018
- Kongsberg Maritime – Yara
- 120 TEU
- 9 NM factory – port
- 6 -> 0 crew (3 now)

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TECHNOLOGY

- Leading in development of autonomy
- Frontrunner in digital development
- Trusted on cyber security

Management and operation of autonomous and remote-controlled vessels

OPERATION

- Experienced in vessel operation
- Major logistics operator at sea and on land
- One of the largest maritime network globally

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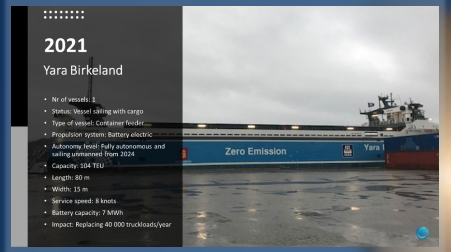
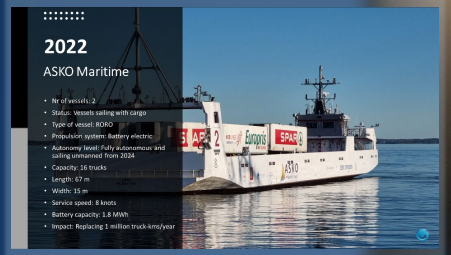
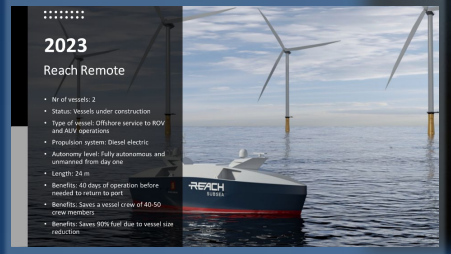
Management and operation of autonomous vessels

- Concept development
- Front-end engineering
- Cooperation with design companies
- Collaboration with authorities
- Newbuilding Supervision
- Technical Management
- Operation







Document of compliance (license to operate)

Sjøfartsdirektoratet
Norwegian Maritime Authority

NIS//NOR

Notification of assignment of responsibilities imposed by the **ISM-Code**

To:
The Norwegian Maritime Authority, Dep. of Ship Registration
PO Box 73 Nygårdstangen
N-5838 BERGEN, NORWAY

Date: 05.04.2024

Please be advised that:
Massterly A/S
(Manager's name)
has assumed the responsibility for the Safe Operation and Pollution Prevention aspects and has agreed to take over all duties and responsibilities imposed by the International Safety Management (ISM) Code (IMO Res. A.741(18)) of the following vessel owned by:
ASKO Maritime
(Owner's name)

Name of vessel	Call sign	IMO number
Therese	LGMN	9921788

The manager is responsible for all duties imposed by the ISM Code, including the implementation and maintenance of the ISM Code, on board the above mentioned vessel

Where Management Company other than the above has been registered according to the NIS-Act § 1,2, 1.3, or Maritime Act § 1, 3.section, the owner of the vessel hereby confirms that this manager performs the main part of either the technical or commercial activity

Full details of OWNER
Registered Owner's IMO Identification Number: 4291006
Name: ASKO Maritime
Address: Tollbugata 1, 3187 Horten

Full details of MANAGING COMPANY
Company IMO Identification Number: 4290997
Name: Massterly A/S
Address: Strandveien 20 1366 Lysaker

(Owner's signature) (Managing company's signature)

The document has been recorded
Journal no 3081 Date 5.4.24 Time 09:00
Fee NOK ____ duty NOK ____
The Norwegian Ship Register - NOR
Kathrin Hansen

massterly
KR-0014E Amended 10/2007

Sjøfartsdirektoratet
Norwegian Maritime Authority

Our date 23.02.2026
Your reference Tom Eystø
Our reference 2022/79301-57
File no 57/030382
Inquiries to Øyvind Vik
Direct phone +47 52 74 51 98

MASSTERLY
Strandveien 20
1366 Lysaker
Norway

REACH REMOTE 1 JXMQ - IMO 9972191
Letter of Approval for Remote Operation from a Remote Operation Center

This Letter of Approval is issued by the Norwegian Maritime Authority for the above-mentioned vessel for remote commercial operation from the designated Remote Operation Center in Norway.

The acceptance is based on the completion of an IMO MSC.1/Circ.1455 process, conferred by SOLAS I/5, which has been found satisfactory by this Administration. The assessment confirms that the concept, operational arrangements, associated risk assessments and verification activities related to remote operation have been reviewed and accepted to provide a level of safety that is as least equivalent to that prescribed in applicable IMO instruments and regulations provided by The Norwegian Maritime Authority.

The NMA has also assessed the technical arrangements in accordance with the principles set out in NMA circ. RSV 12/2020, under which it has been verified that the unmanned vessel, when operated from the designated Remote Operation Center (ROC), located at Massterly in Horten Norway, maintains the required level of safety and fulfils the intent of the applicable regulatory requirements of an conventional manned vessel.

The letter of acceptance issued by the Norwegian Maritime Authority is also based on a statement from a third party, in this project DNV, confirming that the connectivity and technical systems of particular criticality are assessed and found compliant within the agreed scope of verification and validation.

The NMA sets, as a basis and prerequisite for this novel approval, that if any alterations to the assumptions established for the project occur, the company shall assess and implement any necessary amendments and modifications to ensure the continued safe operation of the vessel in light of new and emerging challenges.

All operational conditions, limitations, and requirements related to the remote operation of the vessel are specified in the vessel's trading certificate.

The ROC shall hold an approved ISM certificate, trading certificate and manning certificate posted in ROC. This letter shall be posted in the ROC.

Yours faithfully

Nils Haktor Bua
seksjonssjef

Øyvind Vik
Seniorsurveyor

This document has been electronically approved and signed.

NIS//NOR

Postal address: Postboks 2222 N-5509 Haugesund
Office address: Smedasundet 50A N-5528 Haugesund
Telephone: +47 52 74 50 00
E-mail: post@sdir.no
Internet: www.sdir.no
Organization no: NO 974 761 262 MVA

Norge

Godkjenningsbevis for sikkerhetsstyring

…elsene i den Internasjonale konvensjon om sikkerhet for menneskeliv til sjøs 1974, med …nber 2014 nr. 1191 om sikkerhetsstyringssystem for norske skip og flyttbare innretninger

på vegne av regjeringen i Norge
av
Sjøfartsdirektoratet

MASSTERLY AS

…e: **Strandveien 20 1366 LYSAKER Norge**

…fikasjonsnr.: **4290997**

…tsstyringssystemet til rederiet er revidert og at det oppfyller kravene i punkt 1.2.3 i den …tsstyring for drift av skip og hindring av forurensning (ISM koden) for den type skip[1] som

Annet lasteskip

Yara and Asko operations

What have we learned after 4 years?

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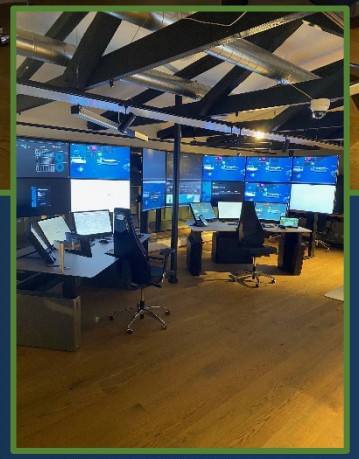
Remote Operations Centre



- Hardware to early?
  - Functionality
  - Operability
  - Authorities
- Initial belief in «one size fits all»
- Underestimated need for supporting software


Zero Emission
Yara Birkeland

- Unneccesary complexity
- Communication with (and within) authorities
- Early involvement of authorities
- Possible to engage surveyors?
- «surprisingly» little issues

ASKO Marit and Therese

- Focus on simplification
- Unexpected errors
- Importance of a system integrator
- Understanding of the end product
- Communication with (and within) authorities
- 99% production (within weather window) in 2025

Port Automation

- Holistic view
- Common understanding of purpose
- As important as vessel for productivity

And now?

Where are we heading in 2026-27

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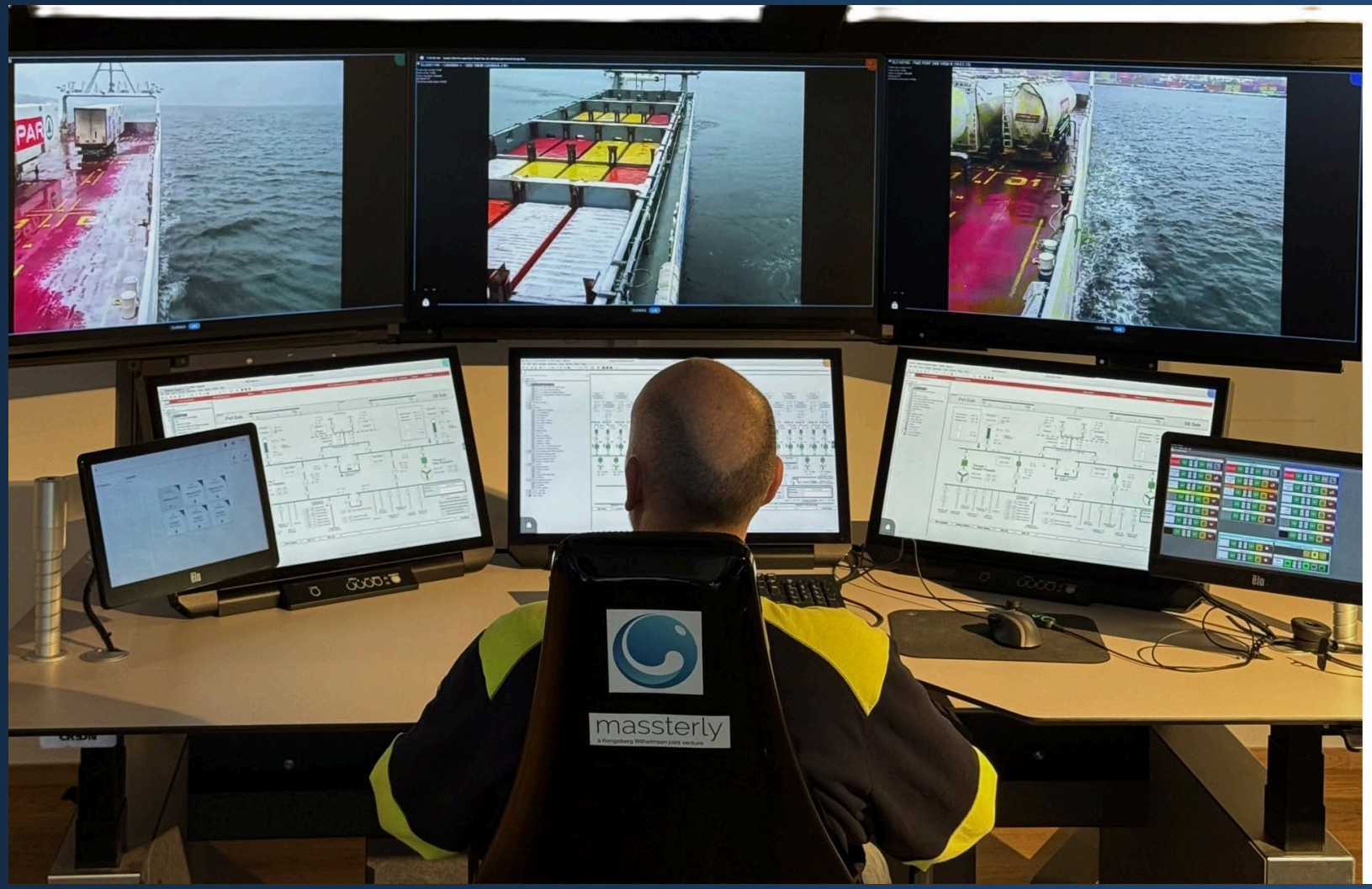
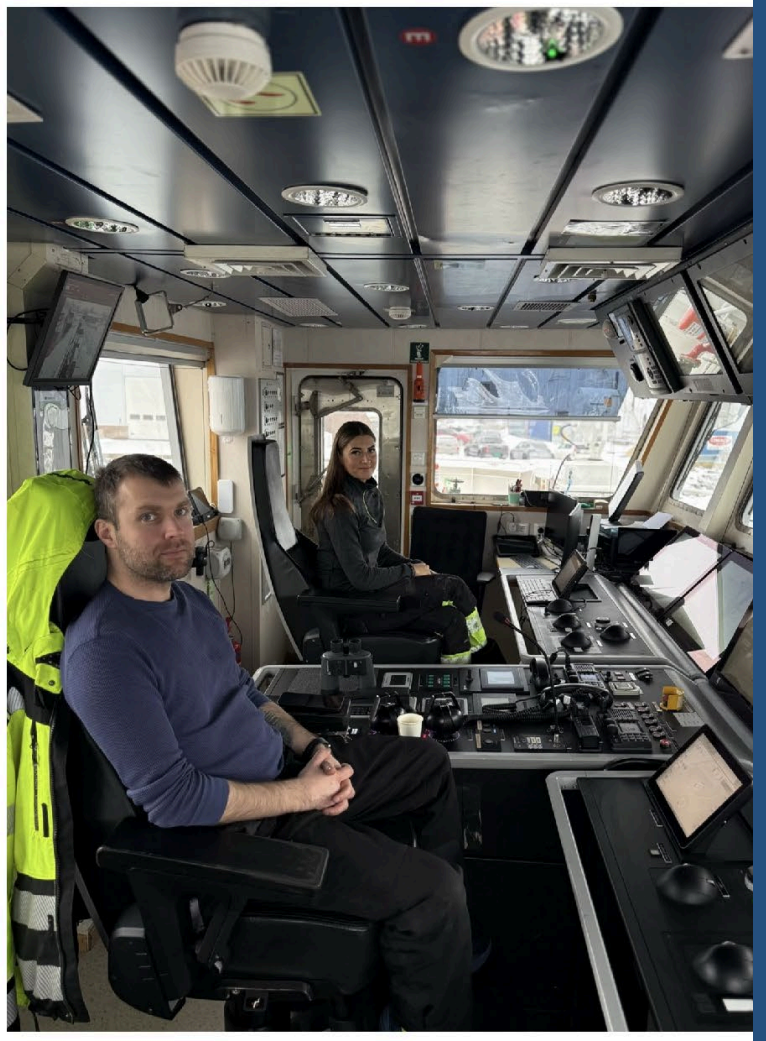
Chief to Shore





ROC UX testing

Situational Awareness
Autonomous Navigation

SEAMLESS

The SEAMLESS Story

We will follow cat food from production to consumer (cat) in Horten, Norway. Our cat lives in a family house in Horten, where the father (or mother) is captain on the vessel Therese, and he executes his job in the Remote Operation Centre. A container with pet food leaves factory in the Netherlands, the vessel Letitia brings the container on river Rhine to Rotterdam, container further to Moss in Norway on a midsize container vessel, electric truck in Norway and the autonomous vessel Marit to Asko distribution centre, finally to a local grocery store where our Captain buys a package of cat food and serves the cat after coming home from work at the ROC.

We will demonstrate usage of MacGregor's VCOP (live), MacGregor's autonomous crane (simulated), "autonomous" vessel (live), ROC operation (live) and ModalNet (live).

Reach Remote 1 operation will be demonstrated (outside SEAMLESS scope), technology developed from Autoship and Seamless.

Funded by the European Union

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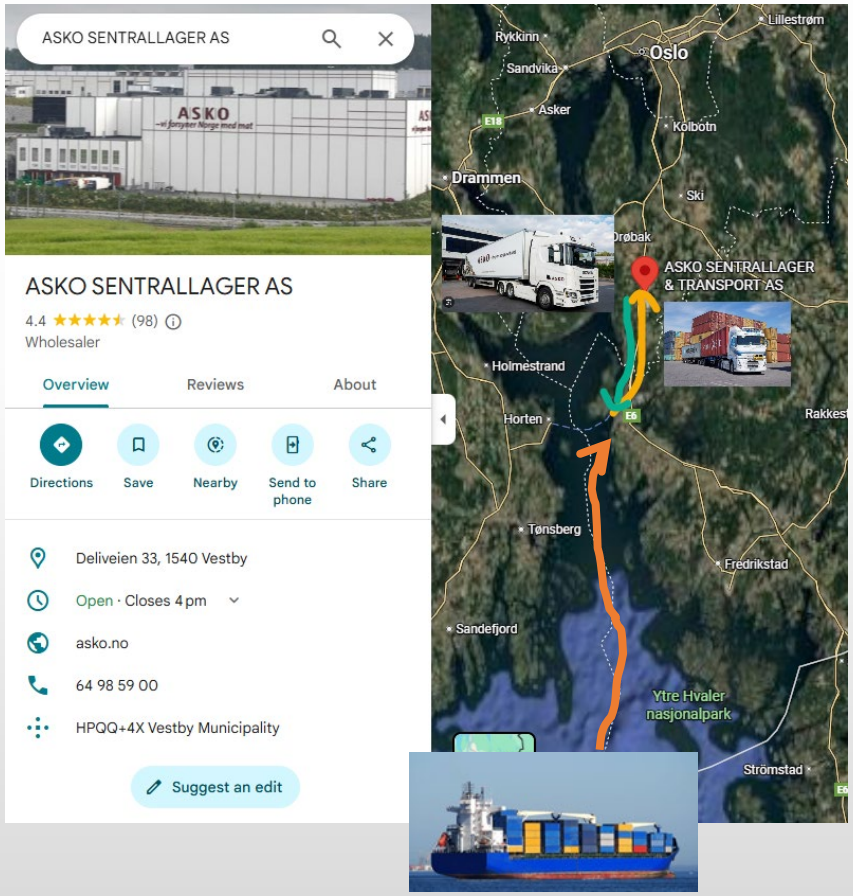
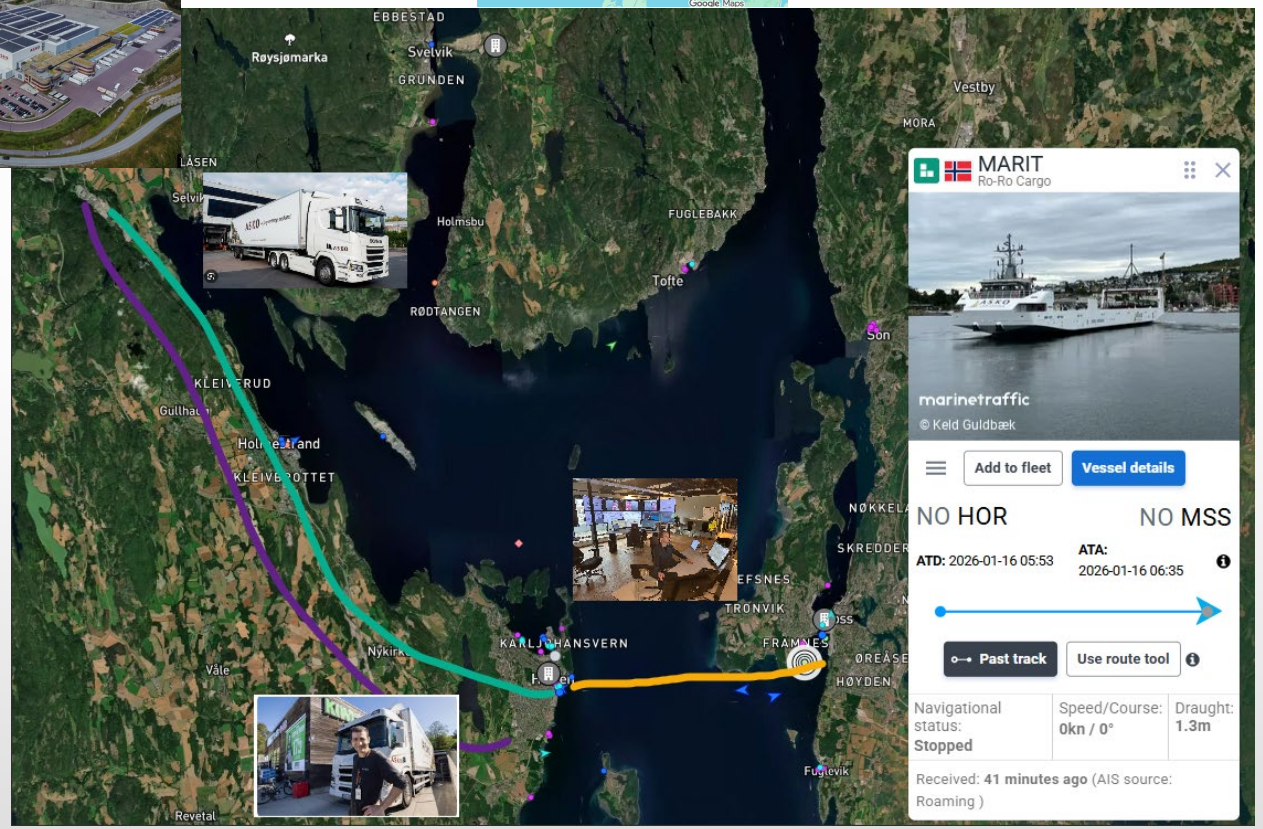
The SEAMLESS Story





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Summary

- Simplification before automisation
- Understanding consequences of design choices
- In-house system knowledge
- Make system integrator responsible
- Follow up on software production and commissioning
- Standardize!
- Involve authorities – from AIP to final survey

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Chief Growth Officer

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