



massterly  
a Kongsberg Wilhelmsen joint venture

# Greener, smarter and safer shipping through autonomy

By Roger Holm , COO

Massterly - a Kongsberg Wilhelmsen joint venture.

# Massterly is Kongsberg and Wilhelmsen's joint effort to develop the autonomous maritime market



## TECHNOLOGY

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

## OPERATION

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



# Massterly is paving the way for autonomous shipping through a close collaboration with partners

## Massterly is working with partners to find solutions for:

- Acceptance criteria for autonomous sailing
- Procedures, roles and competence in Remote Operation Centre (ROC)
- Compliance with international codes (SOLAS, ISM & ISPS)
- Flag state regulations
- Local rules and sailing permits
- Insurance



An aerial photograph of a port area. On the left, a parking lot is filled with numerous white semi-trucks. In the center, a road leads to a loading dock where a truck is being loaded with a large metal cage. To the right, a large cargo ship is docked, its deck covered with stacks of colorful shipping containers in shades of blue, orange, red, and green. The ocean is visible in the upper right corner.

# What do we want to achieve?

Environmentally friendly logistics  
enabling the shift from road to sea



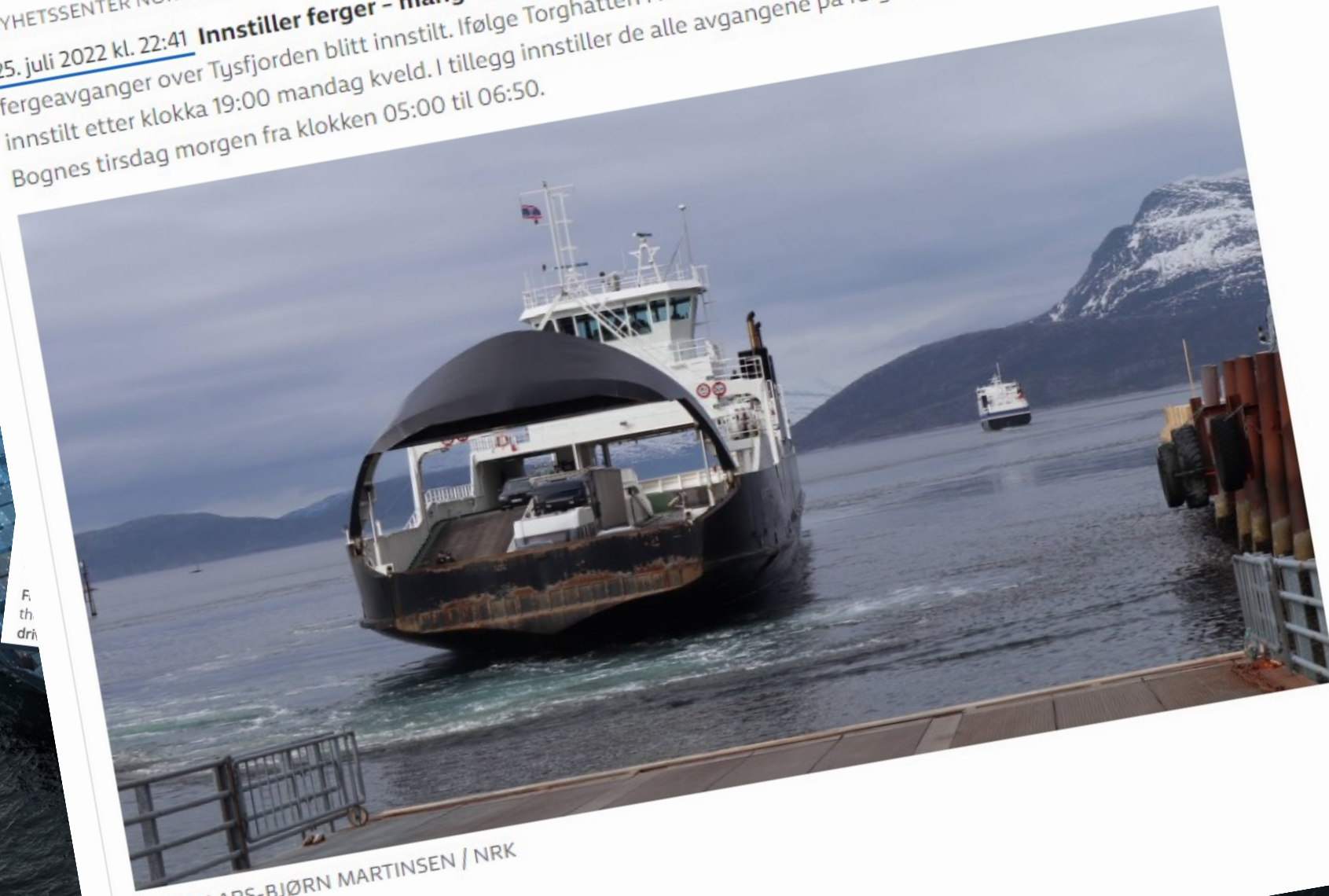
“Autonomy is the  
means, not the target”



In its 2022 -  
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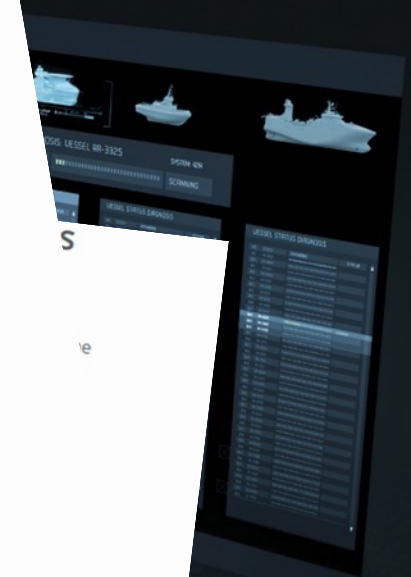
NYHETSSENTER NORDLAND

25. juli 2022 kl. 22:41 **Innstiller ferger - mangler mannskap** • På grunn av mangel på mannskap har flere fergeavganger over Tysfjorden blitt innstilt. Ifølge Torghatten Nord ble alle avganger mellom Drag og Kjøpsvik innstilt etter klokka 19:00 mandag kveld. I tillegg innstiller de alle avgangene på fergeruten mellom Skarberget og Bognes tirsdag morgen fra klokken 05:00 til 06:50.



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FOTO: LARS-BJØRN MARTINSEN / NRK



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# The benefits of autonomy

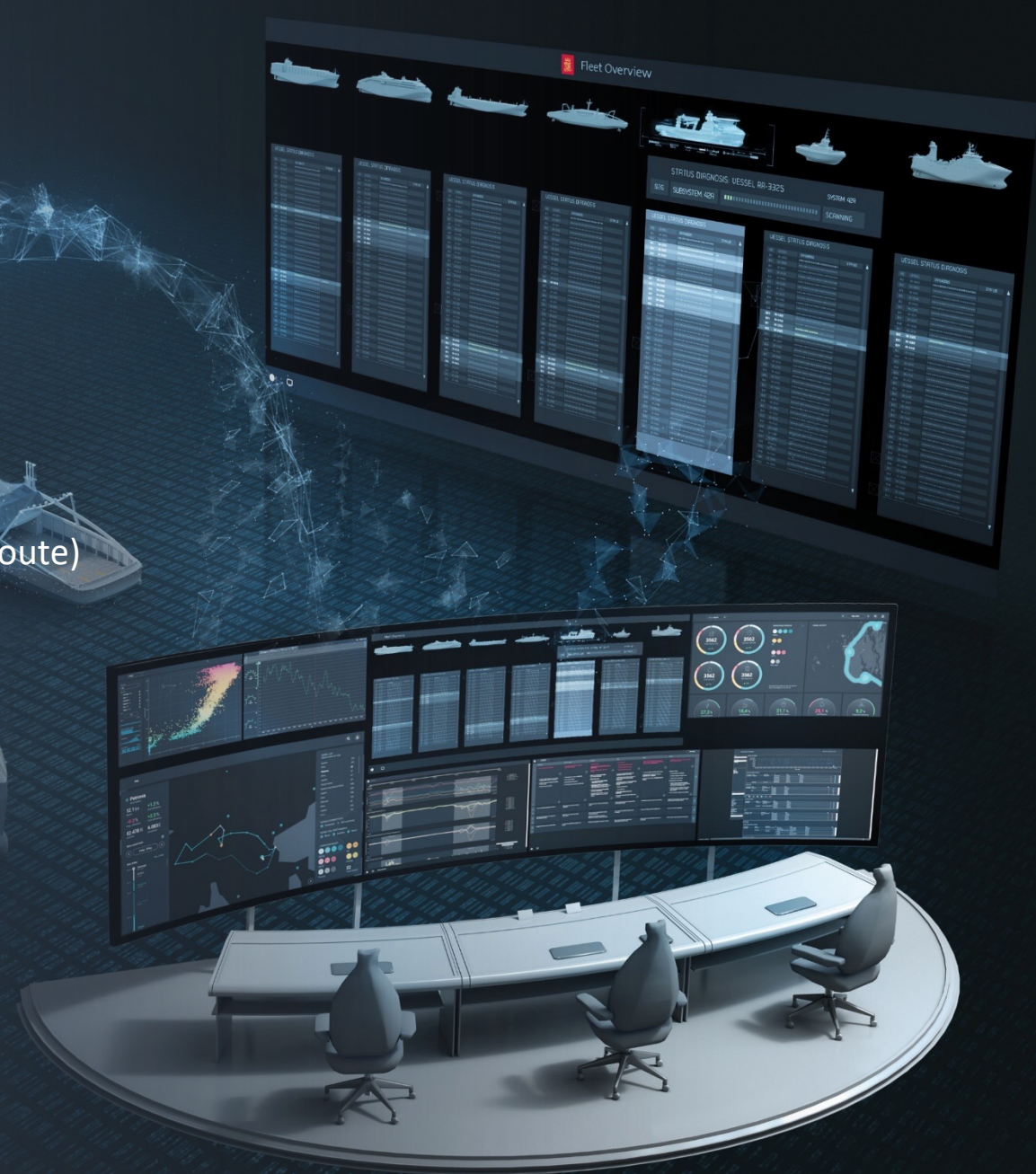
## 1. Improve sustainability and competitiveness for short sea shipping

- Reduced OPEX (no crew)
- Reduced CAPEX (no crew facilities & systems)
- Increased space for cargo (no crew facilities & systems)
- Reduced energy consumption (smaller vessels and optimal sailing route)

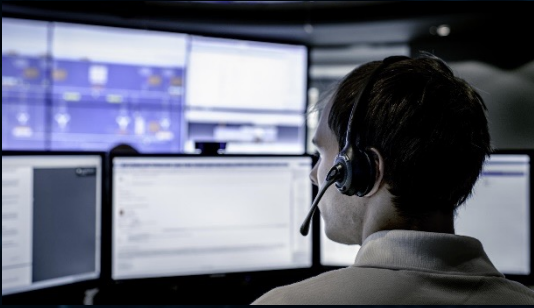
## 2. Increased safety

- Reduced consequence of accidents (no crew in harms way)
- Reduced probability of accidents (no human error)

## 3. Compensate for personnel shortage



# Categories of operations



## REMOTE SUPPORT

Empowering the onboard crew by **remote monitoring** and **support** in an expert in the loop setting.



## REMOTE CONTROL

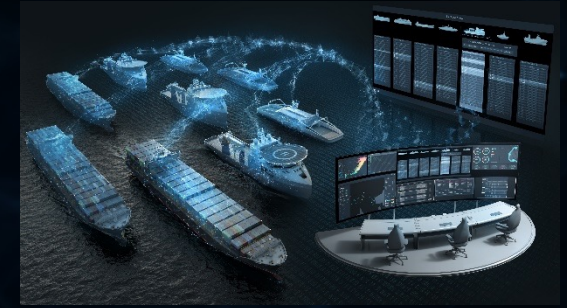
Enabling manned/unmanned vessel operations from a remote location with **direct control** capability.

Alleviate the workload of the onboard crew by providing **assisted control** capability.



## AUTONOMOUS

Autonomous vessel operations with **monitoring, supervision** and **intervention** capability from a remote location.

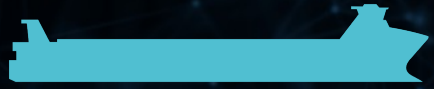


## FLEET

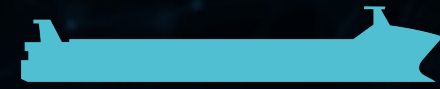
Large scale fleet operations solution including **mission management, planning, scheduling, resource management** supplementary to other categories of operations.



# The new bridge



Conventional manual operation

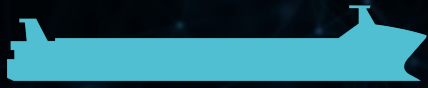


Autonomous remote operation





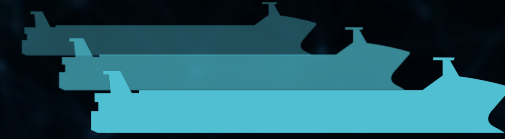
# Ways of operating based on operational scenario



High Attention View



- Single vessel control
- Sensitive vessel operations
- Remote control or autonomous vessel support



Low Attention View



- Multiple vessel control (fleet)
- Monitoring and supervision for autonomous vessels



# How we believe the operation will work

## THE BRIDGE TEAM

### SUPERVISOR

#### Master

Ultimate responsibility for the safety of the ship

### OPERATOR

#### Officer On Watch

Responsible for managing the bridge team and accountable to the Master for safe navigation of the ship

### AUTONOMY

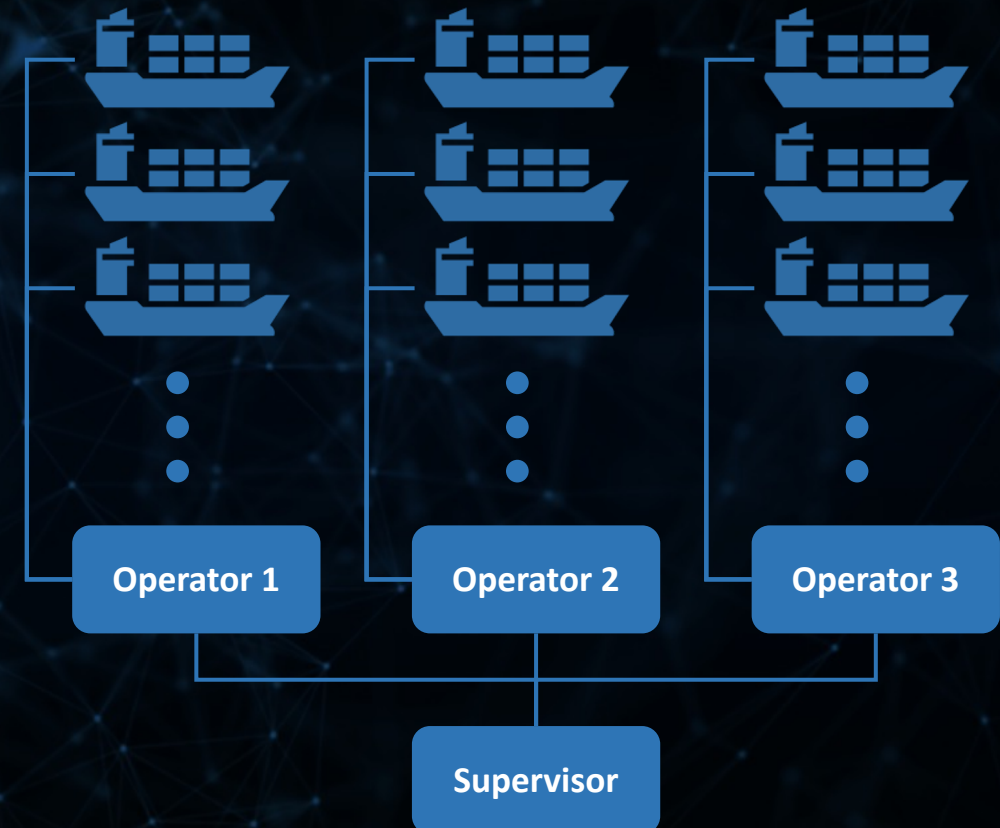
#### Look-out

An all round look-out by sight and hearing, reporting all sightings to the Officer On Watch

#### Helmsman

Executes steering instruction from the Officer On Watch

## THE REMOTE OPERATION CENTRE



# ROC tasks

- Mission Planning
- Operation Monitoring
- Maintenance
- Exception Handling
- Communication



# Competency for ROC staff

- Massterly has a total of 6 master's 4 navigators 4 ETO's and 1 Chief engineer.
- These positions will be transferred to the ROC once we are fully autonomous.

## ROC Operator Course

- University of South-East Norway will offer training and additional certification needed for ROC personnel (e.g., cyber security and data management)
- Prerequisite for entering the program: Navigational/engineering License + Experience
- Follow recommendations of "DNVGL RP 0323 COMPETENCE SCHEME FOR SHORE CONTROL CENTER OPERATOR"

## Training and drills.

- Wit regards to Drill and emergency response training, we are reviewing a cooperation with USN to establish scenario based Simulator Training



2020

### Bastø Fosen

- Nr of vessels: 6
- Status: Vessels sailing with cargo
- Type of vessel: RoPax ferries
- Propulsion system: Battery and diesel
- Autonomy level: Sailing autonomously and manned since 2020
- Benefits: to save fuel on docking
- Benefits: Reduce contact damages
- Benefits: Reduced risk of collisions in crossings
- Impact: 36 000 crossings per year



2022

### ASKO Maritime

- Nr of vessels: 2
- Status: Vessels sailing with cargo
- Type of vessel: RORO
- Propulsion system: Battery electric
- Autonomy level: Fully autonomous and sailing unmanned from 2024
- Capacity: 16 trucks
- Length: 67 m
- Width: 15 m
- Service speed: 8 knots
- Battery capacity: 1.8 MWh
- Impact: Replacing 1 million truck-kms/year



202X

### Ekornes/DB Schenker

- Nr of vessels: 1
- Status: Concept development
- Type of vessel: Container feeder
- Capacity: 40 TEU
- Propulsion system: Battery electric
- Autonomy level: Fully autonomous and unmanned from day one
- Length: 67 m
- Width: 15 m
- Service speed: 8 knots
- Battery capacity: 0.9 MWh



2020

2022

2024

2021

2023

2021

### Yara Birkeland

- Nr of vessels: 1
- Status: Vessel sailing with cargo
- Type of vessel: Container feeder
- Propulsion system: Battery electric
- Autonomy level: Fully autonomous and sailing unmanned from 2024
- Capacity: 104 TEU
- Length: 80 m
- Width: 15 m
- Service speed: 8 knots
- Battery capacity: 7 MWh
- Impact: Replacing 40 000 truckloads/year



2023

### Reach Remote

- Nr of vessels: 2
- Status: Vessels under construction
- Type of vessel: Offshore service to ROV and AUV operations
- Propulsion system: Diesel electric
- Autonomy level: Fully autonomous and unmanned from day one
- Length: 24 m
- Benefits: 40 days of operation before needed to return to port
- Benefits: Saves a vessel crew of 40-50 crew members
- Benefits: Saves 90% fuel due to vessel size reduction



# Thank you!

Feel free to contact us for more information

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