



Maritime Autonomy Solutions

Confidential and proprietary to Zeabuz AS



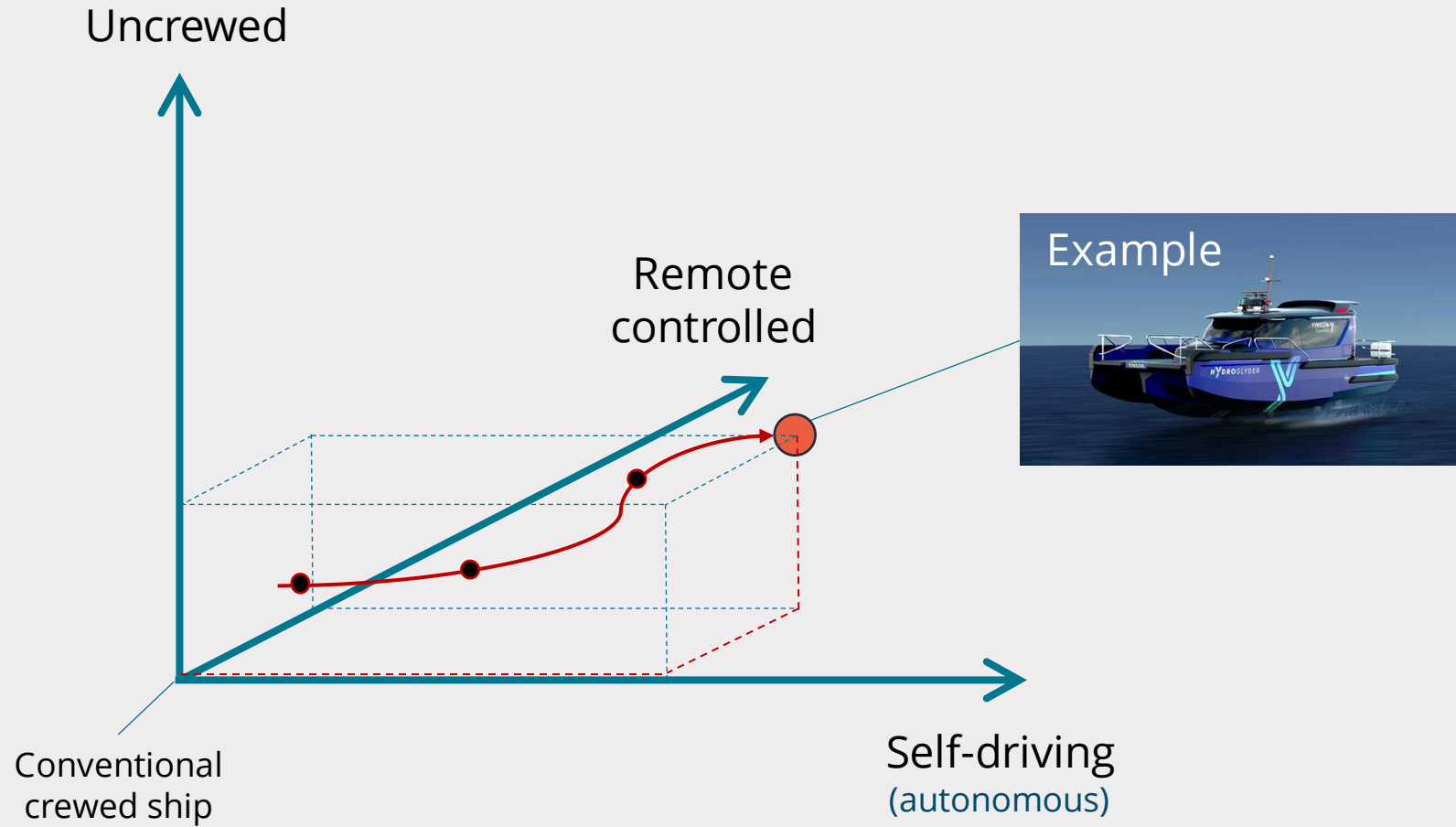
NFAS annual meeting

2023-11-16

Sense – Comprehend – Plan – Act – Supervise



(Autonomy) Maritime Levels of Automation - LoA

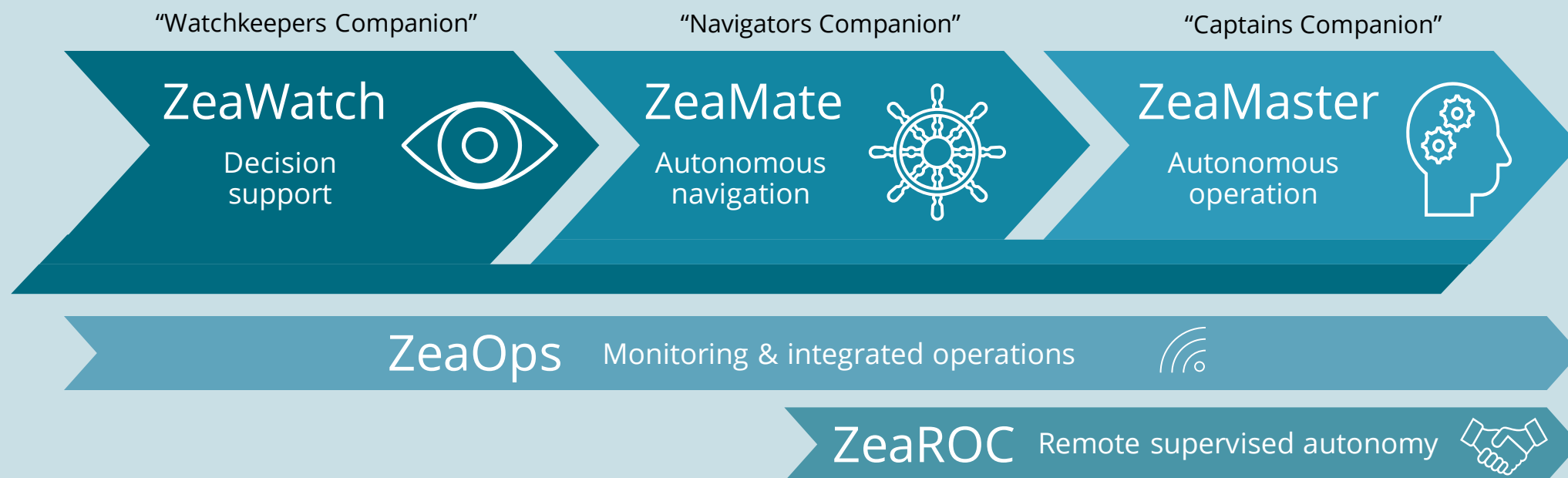


Autonomy is a process, not a state

Zeabuz Maritime Autonomy Solutions

enabling smarter and greener operations

Offering stepwise increasing levels of autonomy and value propositions:



Zeabuz Maritime Autonomy market segments



Virtual Cable Ferries



Shortcut Networks



Work Boats



Car Ferries



Water Shuttles



Inland waterway transport

The Zeabuz shortcut network concept



Benefits:

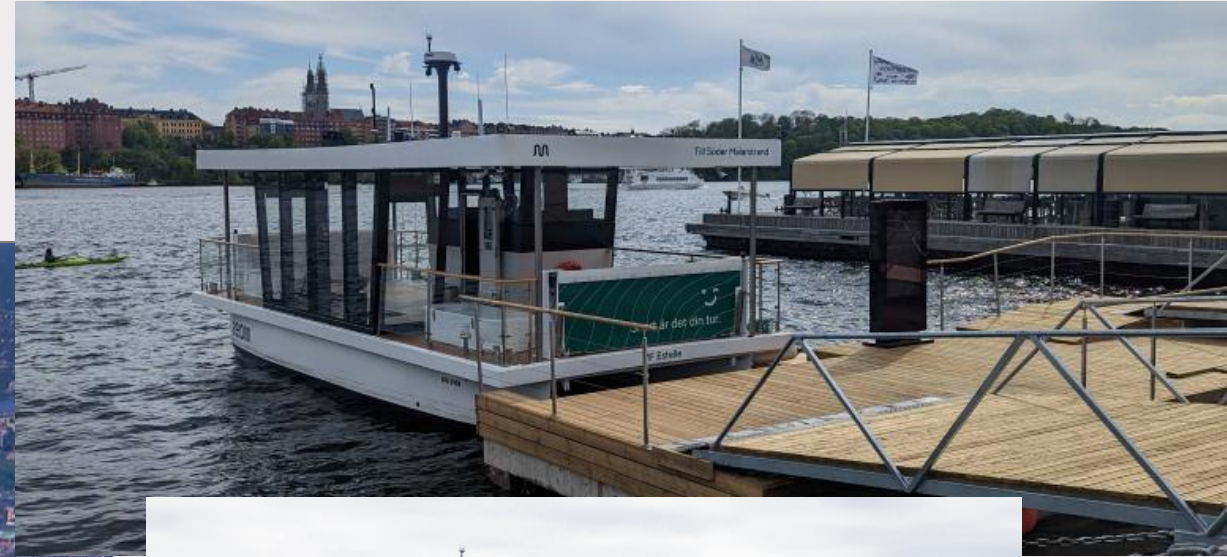
- Zero emission
- Self-driving
- High frequency departures
- Scalable
- Attractive & iconic

September 2022: Trial operation with milliAmpere 2 in Trondheim



- 3 weeks
- 1500 passengers
- 400 crossings

Zeam launched in Stockholm June 2023



Autonomy system
Mobility concept



TORGHATTEN

Operator



BRØDRENE AA

Yard



Marine Technologies

DP system

Shortcut network components

Remote Operations Centre

- High-level supervisory control
- Remote interaction
- Emergency remote control
- Operational monitoring



ROC

High bandwidth communication

Autonomy sensors

Solar panels

Autonomy HW & SW:

- Sensor fusion & object detection
- Dynamic motion planning
- Motion control
- Supervisory / strategic control

Automated ramps

Battery-electric propulsion

Information screens

Waiting area

Ticketing & passenger counting

Docking stations with automated mooring & charging system

Universal accessibility

TSC



2nd line Technical Support Centre

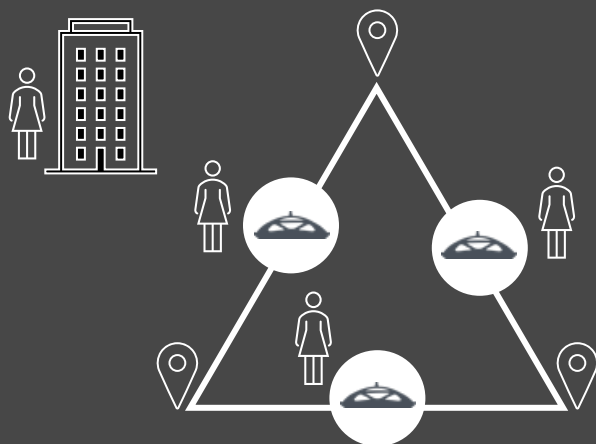
- Remote vessel access
- System lifecycle management
- Monitoring & diagnostics
- Data capture, storage and analysis

Levels of Autonomy for urban shortcuts

Today:

Onboard supervised autonomy

- One certified captain per vessel
- ROC only staffed to build confidence towards higher Levels of Autonomy



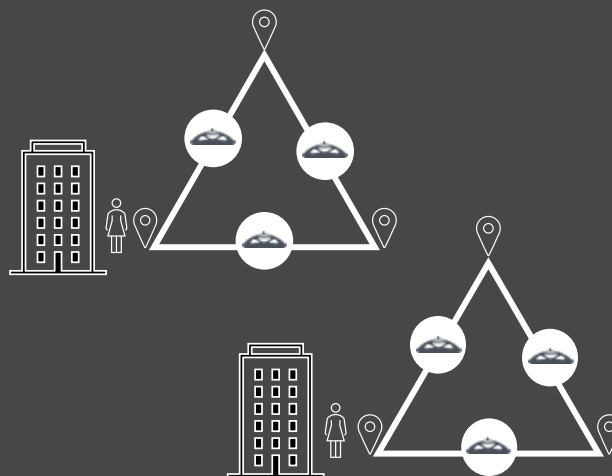
ZeaMate
Autonomous
navigation



Near future:

Onshore supervised autonomy

- One local ROC per network
- One captain per network



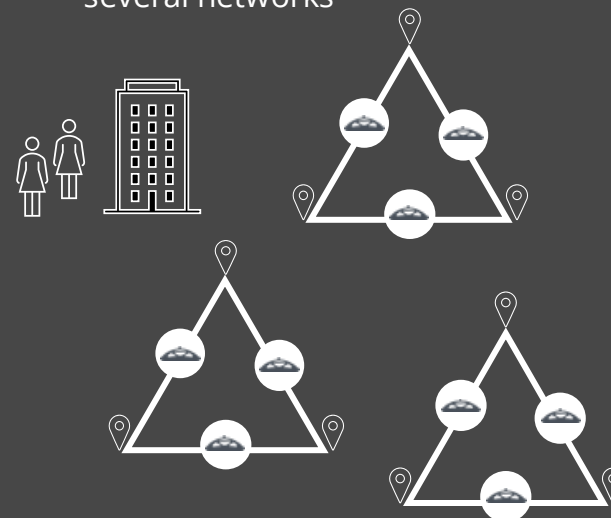
ZeaMaster
Autonomous
operation



In some years:

Remote supervised autonomy

- No local crew or onshore support
- One captain at a central ROC manages several networks



ZeaMaster
Autonomous
operation





Scalable Maritime Autonomy solutions

Øyvind Smogeli, CTO and Co-founder, oyvind.smogeli@zeabuz.com



zeabuz.com

