



Load Handling and autonomy

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Navigating the Future of European Waters with Autonomous Innovation

7 November 2023, Rotterdam

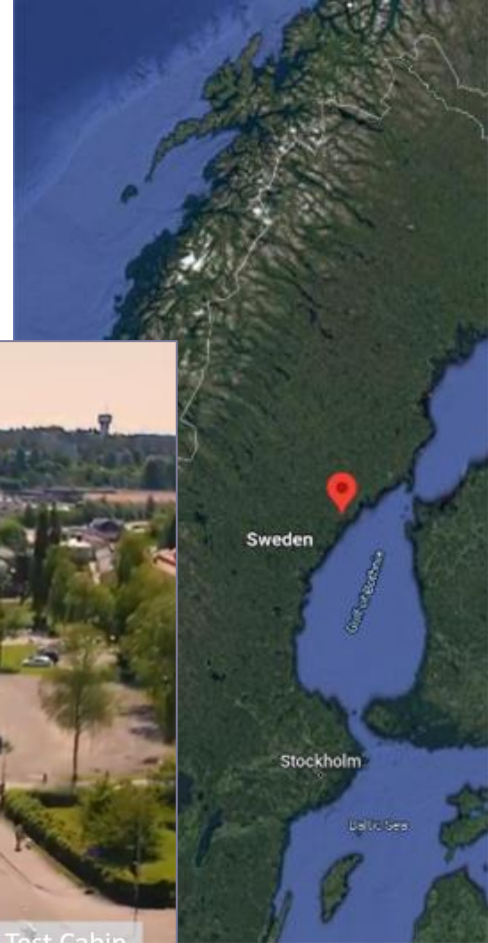
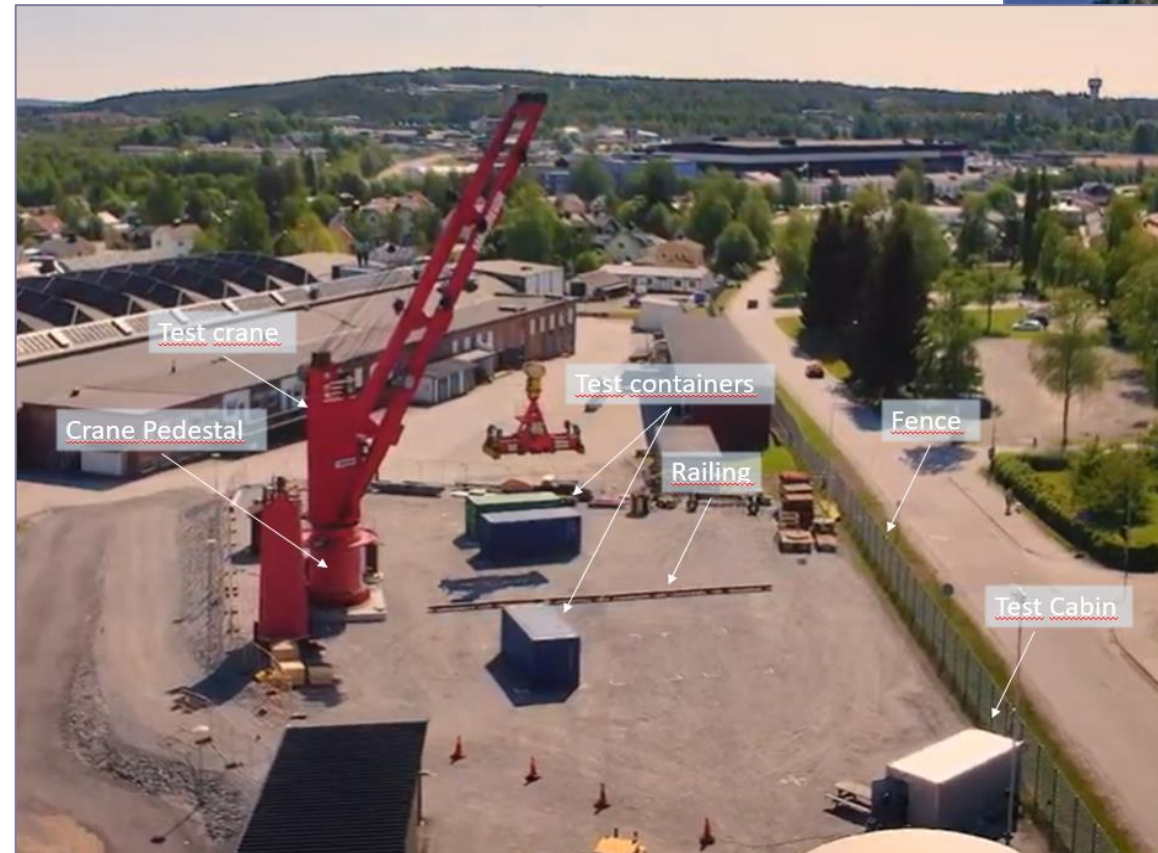


These projects have received funding from the European Union's Horizon 2020 research and innovation programme under grant agreements N° 815012, 859992, 861678.

What we had to conquer? What have we achieved?



- Robotic Crane **NEW**
- Automated Stowage planning for shortsea shipping **NEW**
- Digital Twin development environment





Main mechanical components

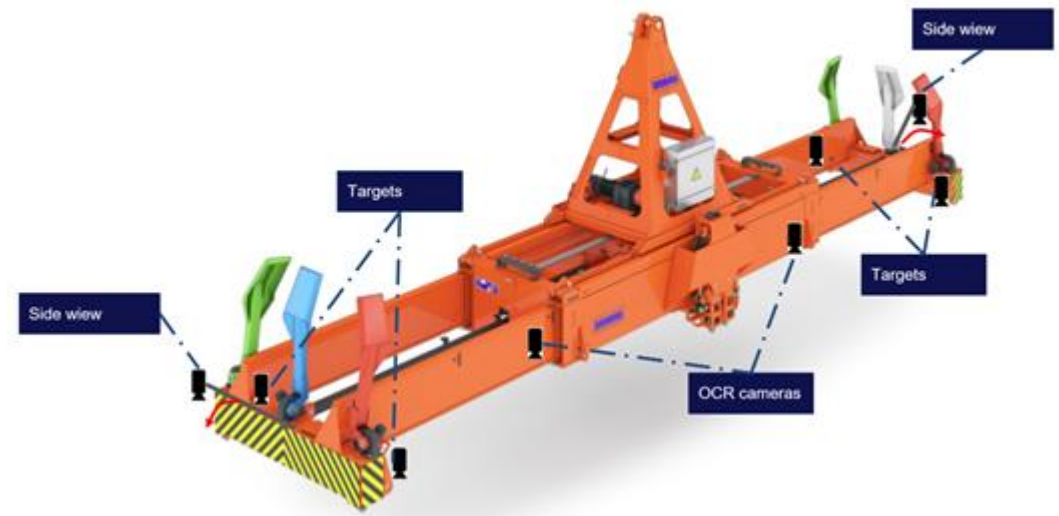


Electric crane GLE

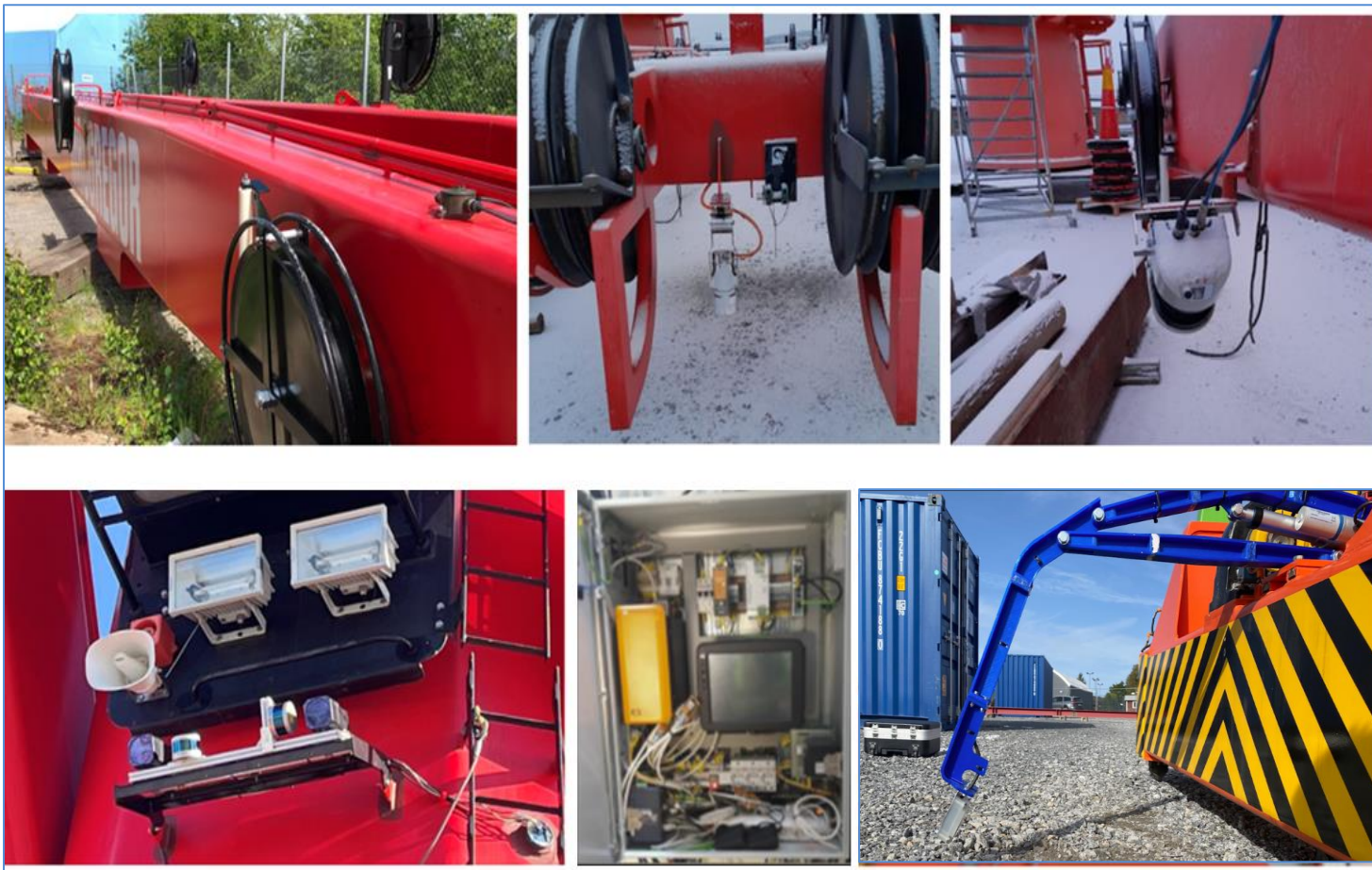
- Swing defeater
- Antipendulation

Spreader

- Load sensors
- Tower control



New mechanical components



- Cable winch for IP-cameras **NEW**
- Jib top IP-camera **NEW**
- LIDAR used for pendulation damping
- Lidar and camera installation **NEW**
- CCU – Crane Control unit inside the crane house **NEW**
- Retractable camera arm **NEW**

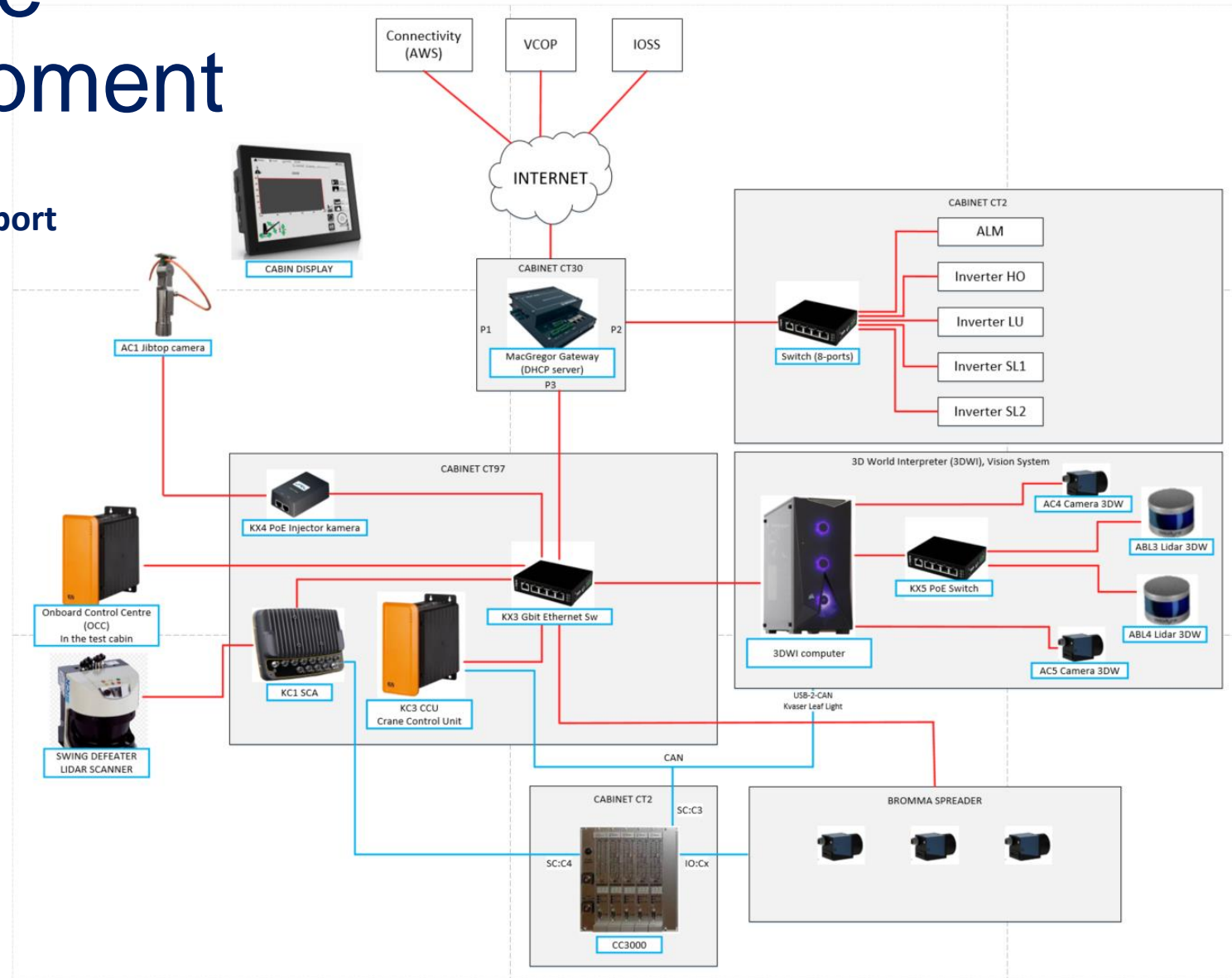




Robotic crane

- SW development

- **IOSS NEW**
 - Intelligent Operator Support System
- **VCOP NEW**
 - (un)loading sequence
- **3DWI NEW**
 - Vision system
- **Spreader Control NEW**
 - Lock on Target
 - OCR Reading
- **Crane Control**
 - **OCC FEATURES ADDED**
 - **CCU NEW**
 - **CC3000 FEATURES ADDED**



Voyage and Container Optimization Platform (VCOP) **NEW**



MACGREGOR AEGIS VCOP - Cargo Booker

VCO HOME MY DRAFTS MY BOOKINGS NOTIFICATIONS

SEARCH CONTAINERS

Container ID or booking number
Enter ID or number

FILTER BY

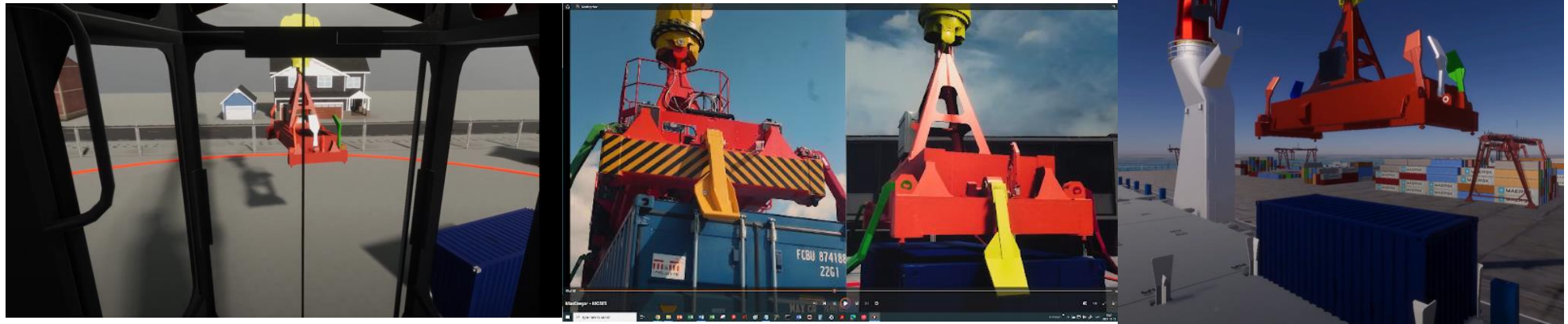
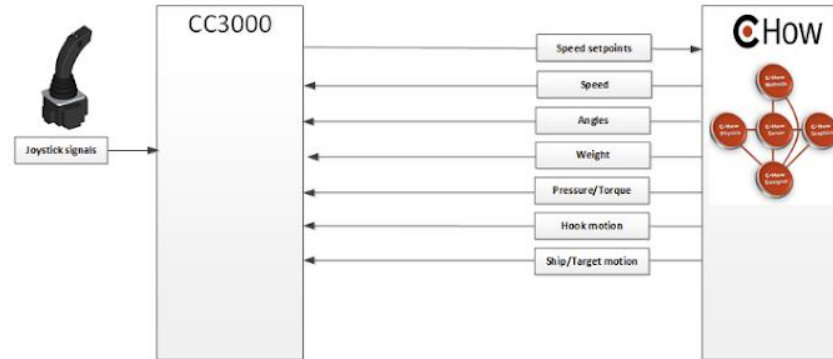
Port of loading
Port of discharge

Containers (26)

| Container | Booking Number |
|--|----------------|
| OBD222 Container Type: 22G0 Container Weight: 28.5 MT Cargo Origin: Cargotec Ruskontie 13 Booked Vessel: VCO Unity IMO1234567 Port of Loading: Rauma FIRAU Port of Discharge: Larvik NOLAR Transit to final destination: Sintef Captain Alley 11 Booking accepted N/A Vessel ETA: 7.11.2023 11:00:00 N/A | TDF33 |
| CID123312 Container Type: 22G0 Container Weight: 28.5 MT Req. Temp: -30°C | BN3222 |



Digital twin development environment





Lessons learned & way forward



- Consortium member integration as early as possible
- Digital twin design environment
- Pre-project S-o-A components were fully utilized as planned

- Accuracy improvement (stacking of containers)
 - Optimal crane type
 - Vessel motion control
- Robust operation
 - Climate proofed sensors
- Autonomy vs. Semi-autonomy





Thank you

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