

# DAMEN ELECTRIC REVERSE STERN DRIVE TUG



# Reversed Stern Drive Tug 2513 Electric

“AQUA POLLUX”



## GENERAL

Yard number	514003
Delivery date	October 2024
Basic functions	Towing and mooring operations
Classification	Bureau Veritas 1 ✳ HULL • MACH Escort Tug (Bollard pull = 70t) (maximum steering force = 73t, maximum braking force = 96t, maximum escort speed = 10 kn) Unrestricted Navigation AUT UMS INWATER SURVEY COMF-NOISE 3, COMF-VIB 3, ELECTRIC HYBRID (PM,ZE), BATTERY SYSTEM
Flag	Green Passport EU
Owner	St. Vincent Damen Marine Services

## DIMENSIONS

Length overall	24.73 m
Beam overall	13.13 m
Depth at sides	4.95 m
Draught aft	6.50 m
Displacement (98% consumables)	607 t

## TANK CAPACITIES

Fuel oil	45.9 m <sup>3</sup>
Fresh water	11.2 m <sup>3</sup>
Bilge water	5.9 m <sup>3</sup>
Sewage	5.9 m <sup>3</sup>
Clean lubrication oil	1.9 m <sup>3</sup>
Dirty lubrication oil	1.9 m <sup>3</sup>
Urea	1.5 m <sup>3</sup>

## PERFORMANCES\*

Bollard pull	68.3 t
Speed	12.6 kn

\* Specified performances in full electric mode (battery powered)

## PROPULSION SYSTEM

Main engines (electric)	2x Ramme TW 1400r_L
Total power	3700 kW at 500 rpm
Thrusters	Kongsberg Maritime US 255 L-Dive PM FP
Battery capacity	Max. 2782 kWh
Propeller diameter	3000 mm
Forced ventilation	76.000 m <sup>3</sup> /h
Gas exhaust emission	A Damen SCR system is installed for the back-up generator engines, IMO Tier III compliant

## AUXILIARY EQUIPMENT

Generator sets	2x Caterpillar C32TA, 1175 kVA, 690 V, 60 Hz
General service pumps	2x Azcue CA 50/3A, capacity up to 27 m <sup>3</sup> /h up to 3.4 bar
Oily-Bilge water stripping pump	Azcue CA 32/05, capacity up to 10 m <sup>3</sup> /h up to 1.3 bar
Fuel transfer pump	Azcue CA40-1B, capacity up to 12 m <sup>3</sup> /h up to 1.2 bar
Fuel oil purifier	CJC, PTU3 27/81 MZ – E2PWZ
Cooling system	Keel cooling channels and box coolers
Fresh water pressure set	DAB Euroinox 40/50T, capacity 70 l/min up to 3.0 bar

## DECK LAY-OUT

Anchor	360 kg Pool (High Holding Power)
Anchor winch	Electric, minimal hauling speed 10 m/min
Towing winch	Hydraulically driven double drums, pull 35.0 ton up to 10 m/min, maximum speed up to 35 m/min, brake holding force 200 ton (all specified on 2 <sup>nd</sup> layer)
Fendering	D-fender at sides, cylindrical fender at transom corners, cylindrical and W-block bow fender

## ACCOMMODATION

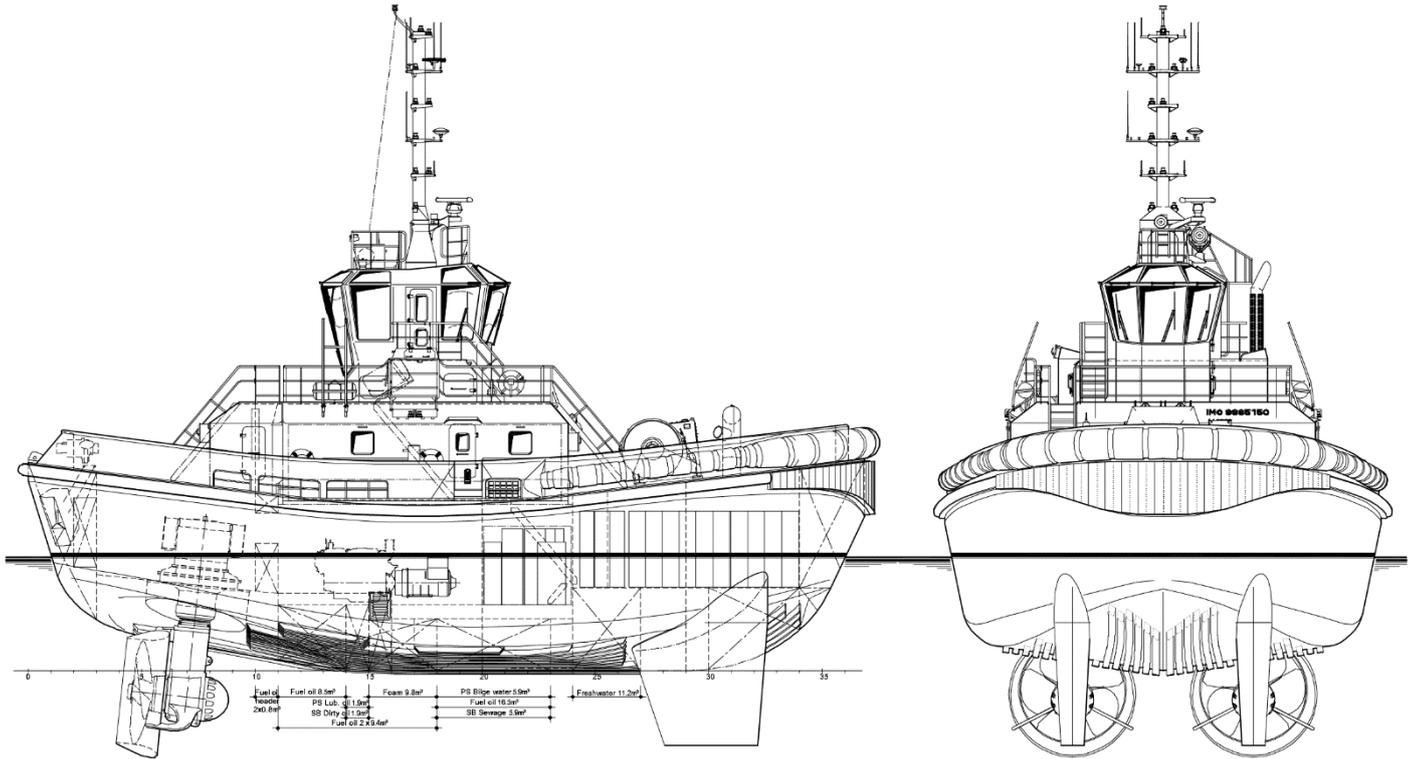
For 6 persons, completely insulated and finished with durable modern linings, sound absorbing ceiling in the wheelhouse and floating floors. Air-conditioned wheelhouse, accommodation and switchboard room. Accommodation above main deck with a captain's cabin, chief engineer's cabin, two double crew cabins, pantry, mess/dayroom and sanitary facilities. The superstructure is mounted resiliently to reduce noise levels.

## NAUTICAL AND COMMUNICATION EQUIPMENT

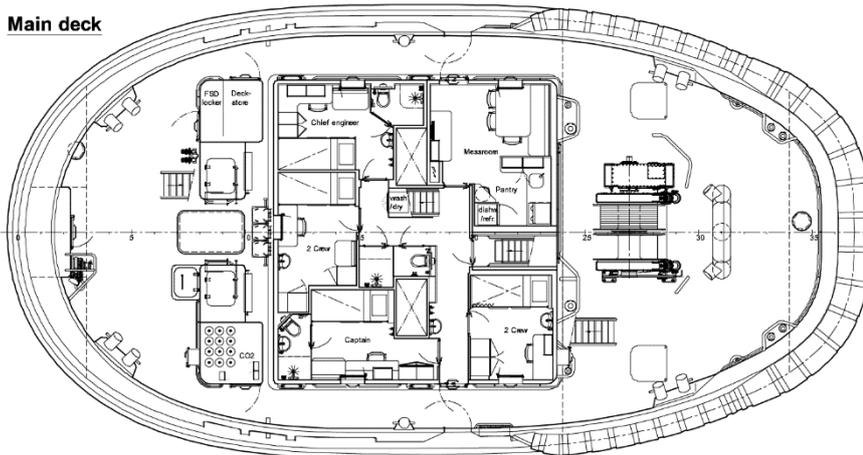
Searchlight	Norselight SH470, 2000 W
Radar system	Furuno FAR-1518-BB
Compass	Cassens & Plath Reflecta 11
Electronic Chart System	MaxSea TX Professional
Autopilot	Simrad AP-70
Satellite compass/GPS	Simrad GN70/HS80A
Echosounder	Furuno FE-800
Speed log	Furuno DS-85
VHF	2x Cobham Sailor 7222, one with DSC
VHF hand-held	2x Sailor SP3540
AIS	Furuno FA-170
Navtex	Furuno NX-700B
EPIRB	Jotron TRON-60AIS
Sart	Jotron TRON AIS
Damen Triton	Monitoring dashboard and cloud, 1 year license
Anemometer	Gill Instruments GMX 500

# Reversed Stern Drive Tug 2513 Electric

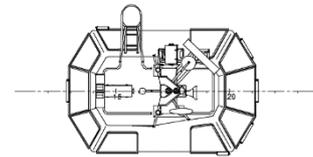
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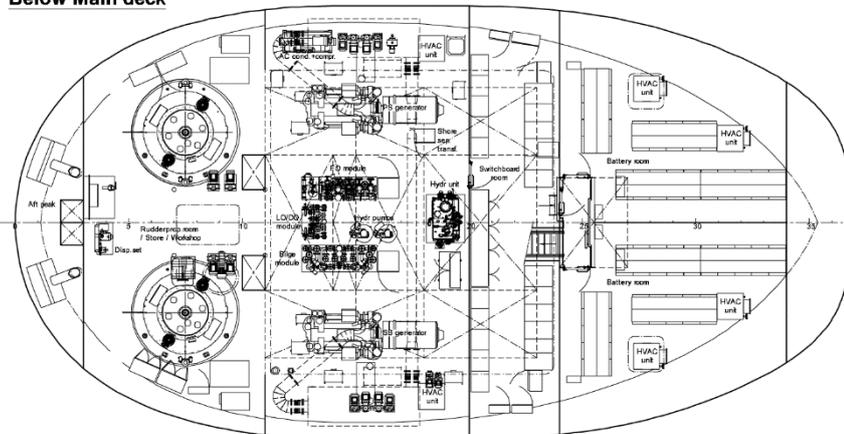
**Main deck**



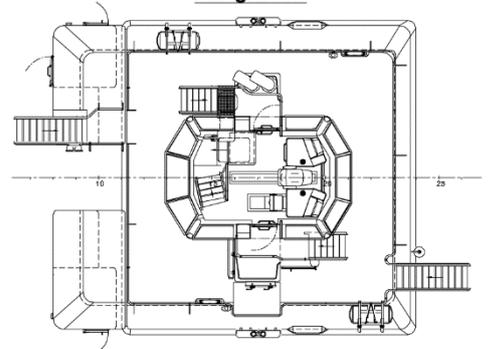
**Top deck**



**Below Main deck**



**Bridge deck**



# RSD 2513 E

## The first fully electric tug



**DAMEN**



### Electric RSD 2513's enter the Damen Maritime Solutions fleet

Damen Shipyards has developed the first tugboat of its kind – the full-sized, 70-tonne bollard pull, Reversed Stern Drive (RSD) 2513 Electric tug.

The RSD-E's story is deeply rooted in Damen's sustainability principles and showcases that an electric tug can perform the same job as a conventional tug if not better, as it contributes to a more sustainable future.

**70** tons bollard pull  
**12.0** knots speed  
**0** emission



### The ESG framework of DMS



## Reversed Stern Drive 2513 E

- Easy charging:** the E-tug can charge for as little as 15 minutes and reach full capacity within two hours
- Electrication eliminates the risk of water pollution during bunkering a diesel engine**
- Fewer local emissions (NOx, SOx, PM)** improve air quality in densely populated areas
- Fitted with energy-efficient LED lighting**
- With right circumstances, the lifetime total cost of the Damen RSD-E Tug 2513 is equal or lower than that of a diesel RSD Tug 2513**
- With its high level of automation, user-friendly interface, and centralized alarm and control system linked to remote monitoring, the vessel can operate with just a crew of two**
- Wheelhouse and cabin is separate structure from the hull, minimizing noise and vibration nuisance from operations**
- Equipped with Triton sensors to capture real time data on the tug's operations and emissions**
- Environmentally friendly**
- Efficient in operation**
- Economically viable**
- Electric propulsion reduces the disturbance of marine life within ports**
- Battery system is designed against failure to enhance onboard safety and prevent emergencies**
- Batteries and generator selected to last the entire 30-year lifespan of the vessel, resulting in less waste**



Take a virtual tour of the E-tug



**FULL SOLUTION TO ZERO EMISSIONS**  
 Damen sells the full innovative solution: electric tug, charging arm, and charging station to support zero emission operations. The charging arm is equipped with safety controls and Human Machine Interface (HMI) for user flexibility.



**ONBOARD COMFORT**  
 The RSD-E accommodates six people and is equipped with fully insulated and durable modern linings, a sound-absorbing ceiling in the wheelhouse, and floating floors. These features reduce noise from the engine room, providing a quiet and comfortable onboard environment.



## ESG highlights Damen Song Cam

Damen Song Cam is a workboats yard specializing in the production of tugs, with over a decade of commitment to sustainability.

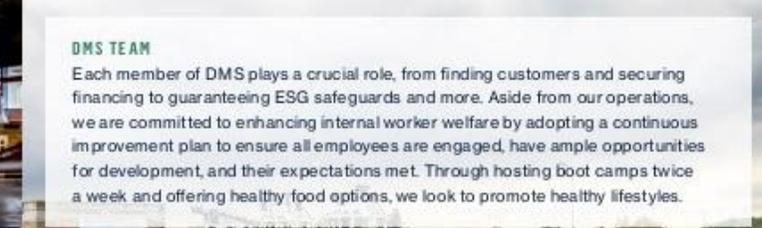
This is shown through continuous monitoring and improvement on the yard's:

- Health and safety practices
- Environmental impact
- Risk management
- Worker welfare and labor practices
- Subcontractor and supply chain management



## Accelerating local economic growth

- Local workforce is present on every level of the organization
- Hiring from the local commune
- Promoting presence of women in management positions
- Non-discrimination safeguards and equal opportunities to all employees
- All employees are paid a living wage, ensuring a decent standard of living that meets their every need



### DMS TEAM

Each member of DMS plays a crucial role, from finding customers and securing financing to guaranteeing ESG safeguards and more. Aside from our operations, we are committed to enhancing internal worker welfare by adopting a continuous improvement plan to ensure all employees are engaged, have ample opportunities for development, and their expectations met. Through hosting boot camps twice a week and offering healthy food options, we look to promote healthy lifestyles.



### ON THE YARD

- Quarterly reporting of CO<sub>2</sub> emissions
- Investment in solar energy sources
- Lunch and learn safety sessions
- Cultural awareness trainings
- Beach and harbour clean up
- Advocate health, safety and professional development



### WITHIN THE LOCAL COMMUNITY

- Child abuse prevention program
- Waste infrastructure and knowledge sharing – getting children involved to prevent waste pollution
- Annual local sponsorship projects, scholarships, and student grants
- Collaboration with local high schools for knowledge sharing and recruitment
- DSCS Corporate Community Day

### CIRCULAR ECONOMY

The RSD-E's circularity was measured with the Circular Transition Indicator (CTI) tool. The analysis gave the first recommendations on how Damen can increase the E-RSD's circularity from 10.17% to 49%.



- Minimize the use of raw materials and design out waste and pollution
- Retain the value vessels, components and materials
- Recirculate materials and reuse products to eliminate waste



## Try before you buy

DMS has over 40 years' experience in providing tailored financing solutions. With our experience and strong network, we connect our customers to the financial arrangement that best suits their needs.

Interested in trying out an electric vessel to perform your daily operations? DMS allows our customers to test our sustainable maritime solution while deciding on their vessel renewal.

Our different financing packages include:

- **Supplier's Credit**  
Total financial unbundling
- **Buyer's Credit**  
Serving large, complex contracts
- **Leasing**  
Optimal flexibility



To learn more about DMS, ESG, and Damen vessels, scan the QR code and stay up to date on latest developments.



# OCEANS OF POSSIBILITIES



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### EMISSION COMPARISON

Comparing a Damen Diesel RSD Tug 2513 and an RSD-E Tug 2513, based on a median/average trip or median/average day basis, it can be said that the RSD-E achieves a 100% reduction in all emissions.

If a longer period in which consecutive operations are considered, as was done in this analysis with 349 trips over a period of 5 months, the reduction in CO<sub>2</sub>, SO<sub>x</sub>, and NO<sub>x</sub> emissions is 57% and the reduction in PM is 60%. The E3 profile is used to determine the distribution of engine loads during an operation.



The RSD 2513 E has the E3 label, meaning it was designed to be

**Environmentally friendly,**  
**Efficient in operation and**  
**Economically viable**



and further incorporates:

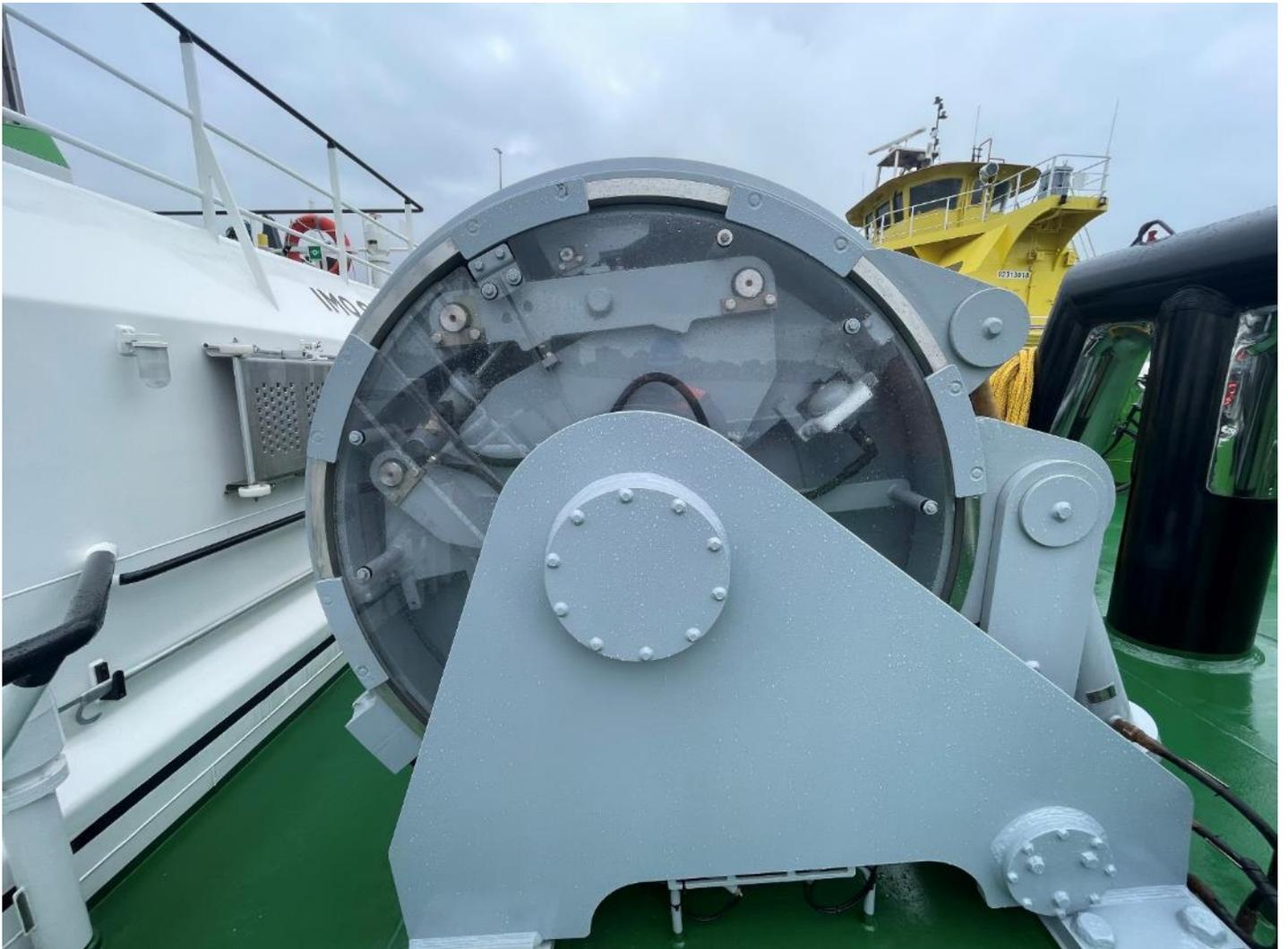
- Enhancement of safety and well-being on board
- Prevention of air pollution and reduction of greenhouse gases emissions
- Future and finance proof sustainable solutions
- Design for optimized operations

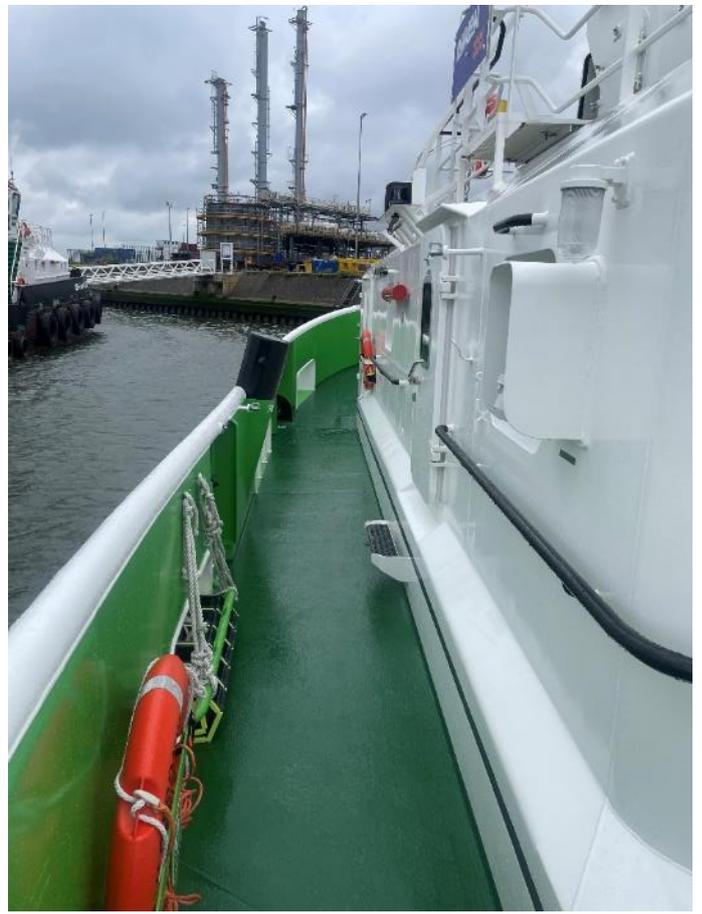




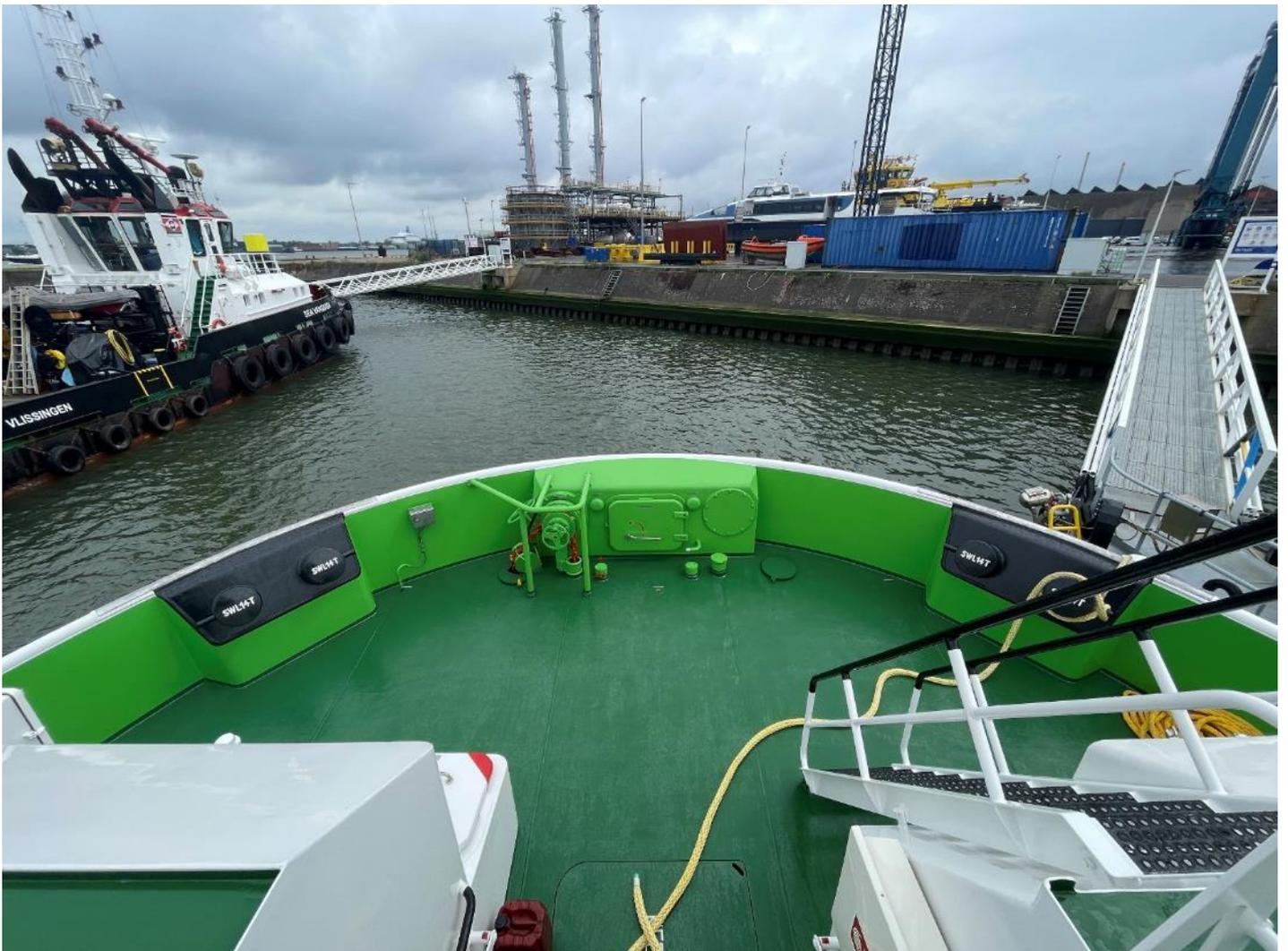


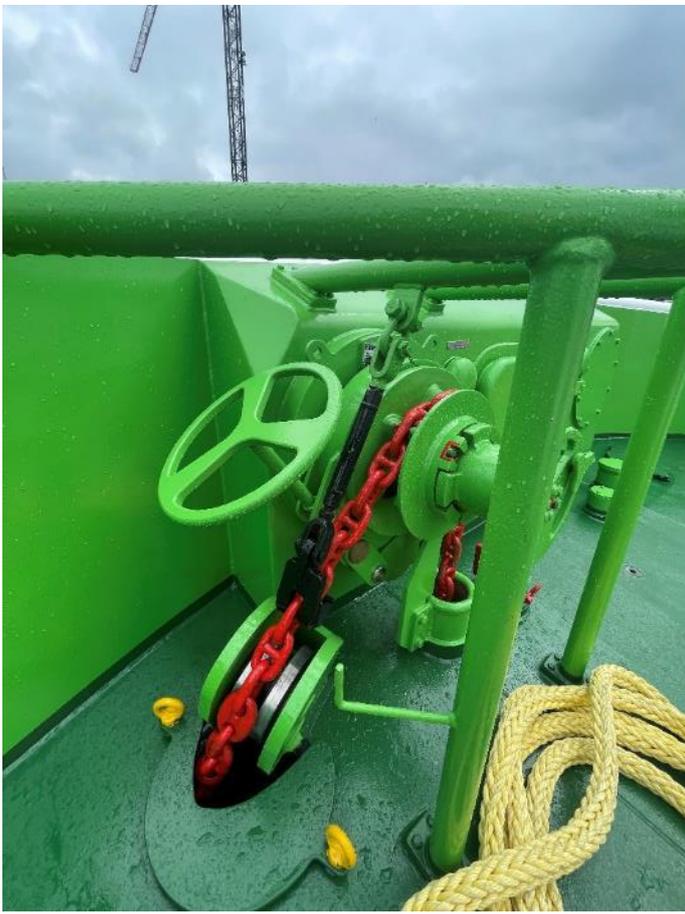






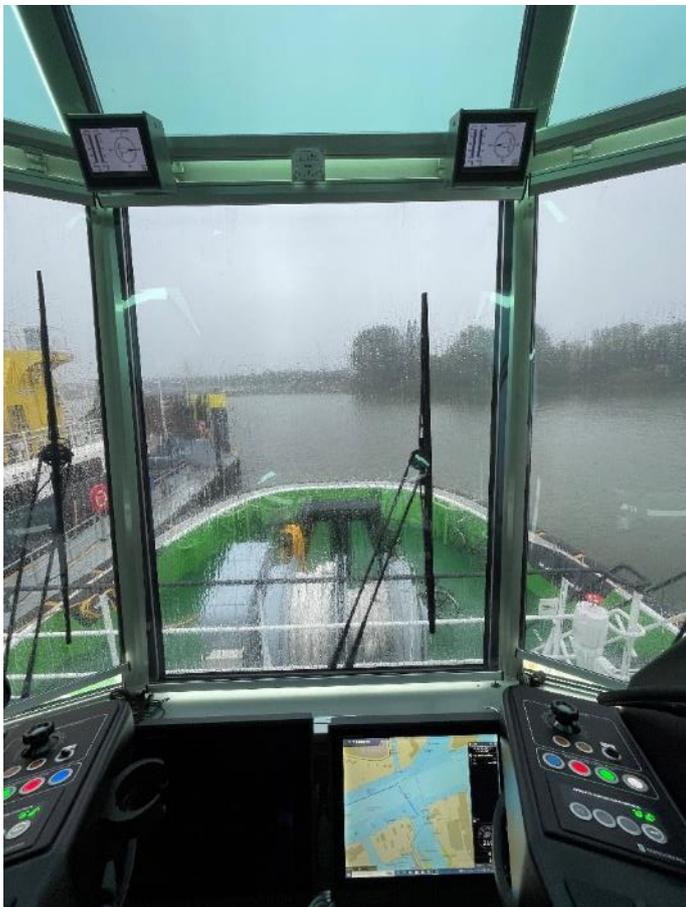




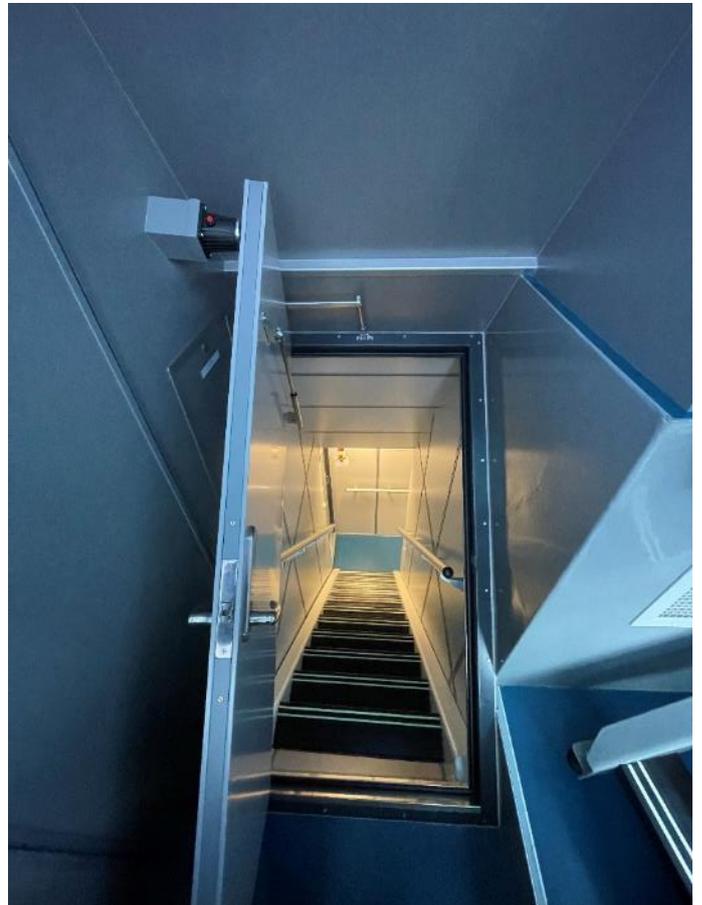
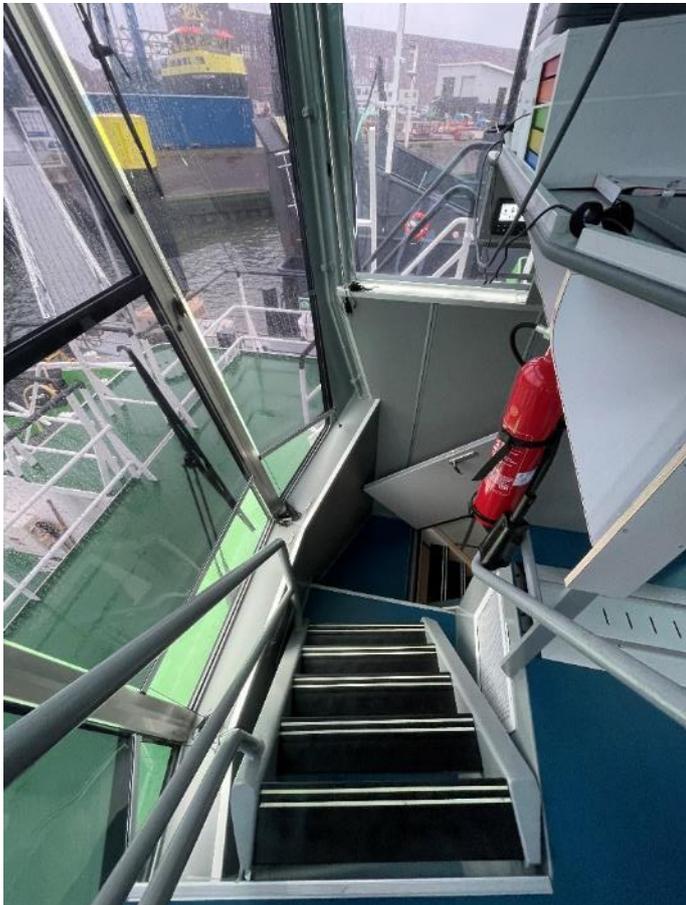


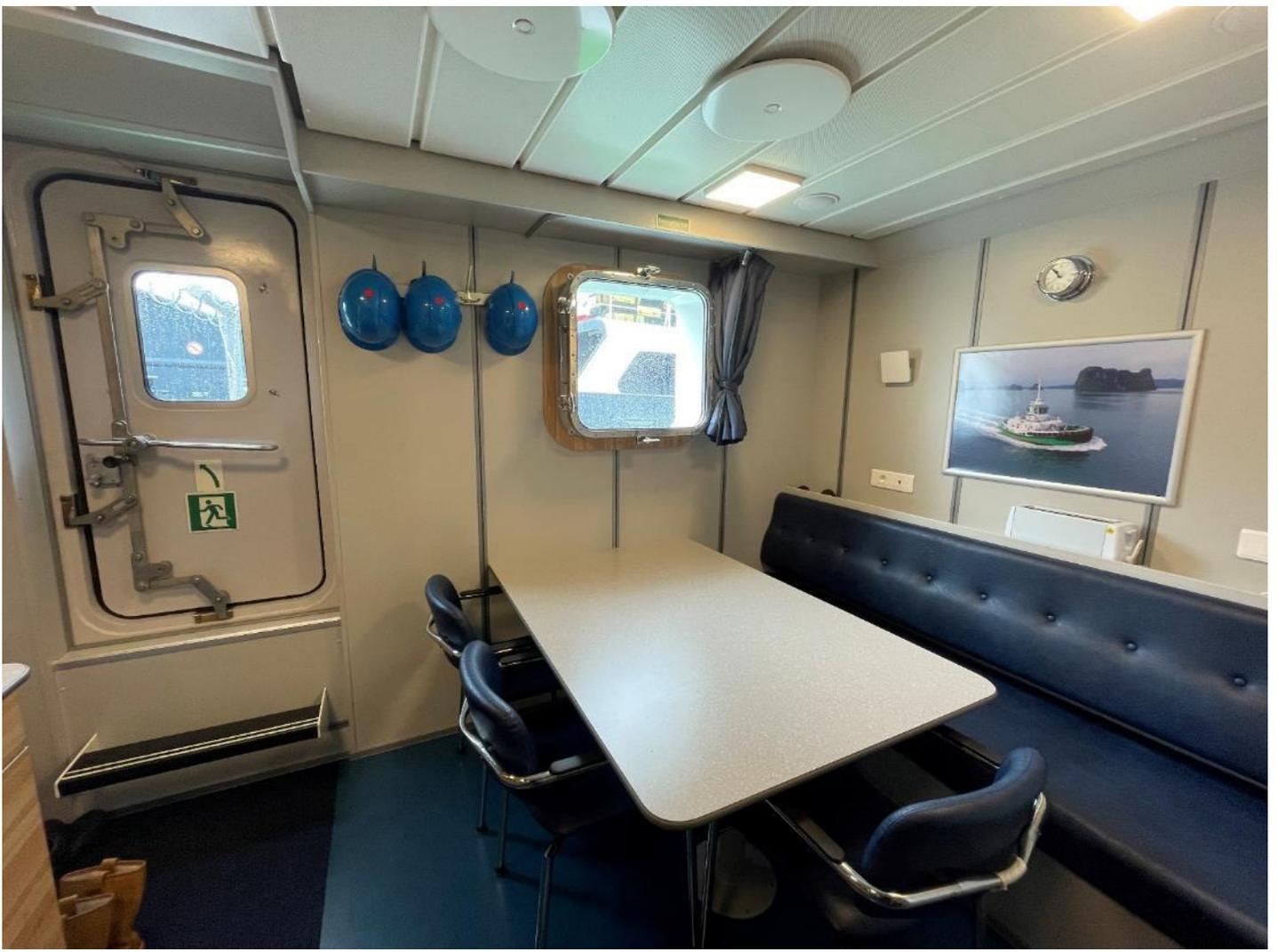


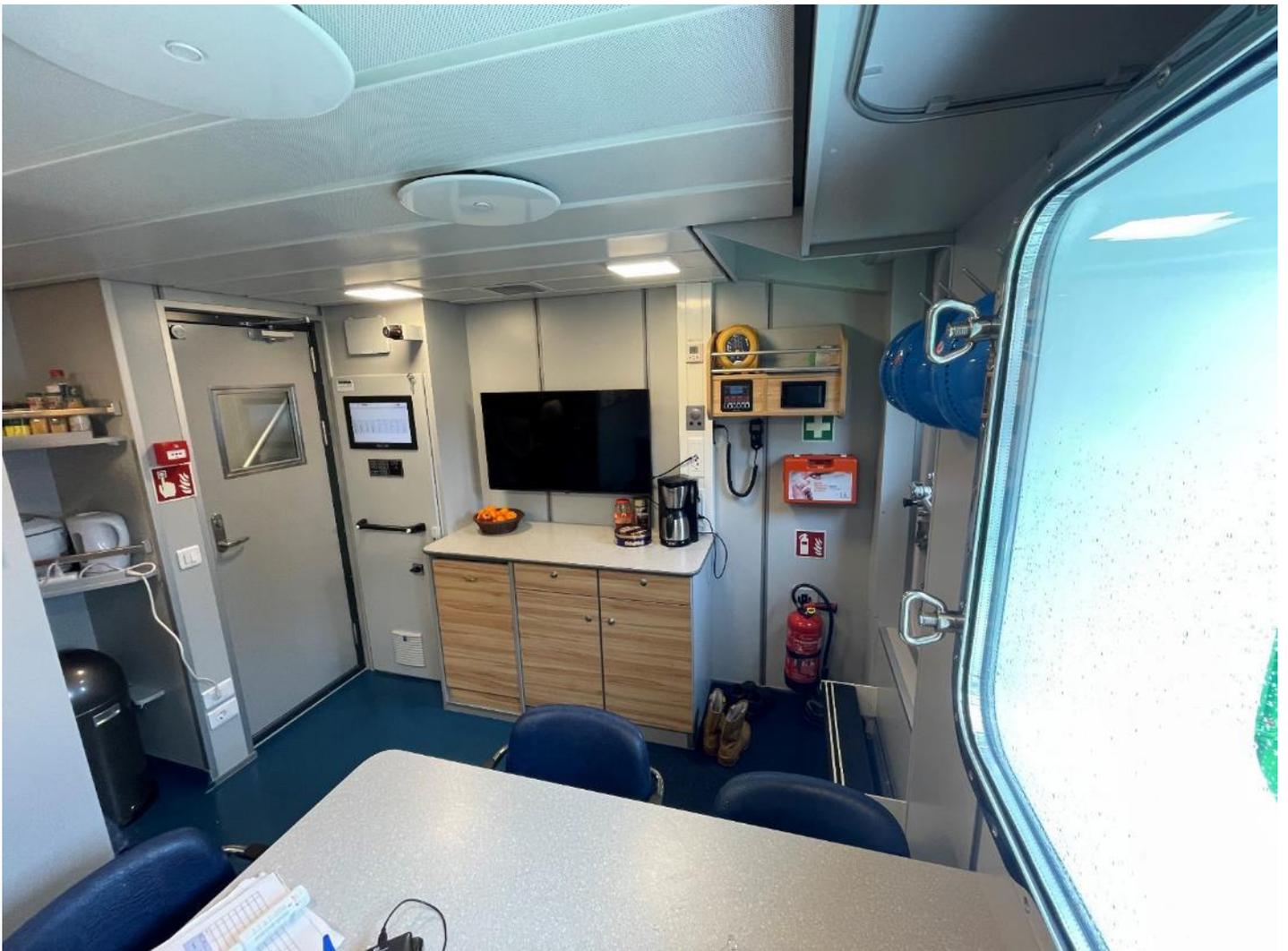


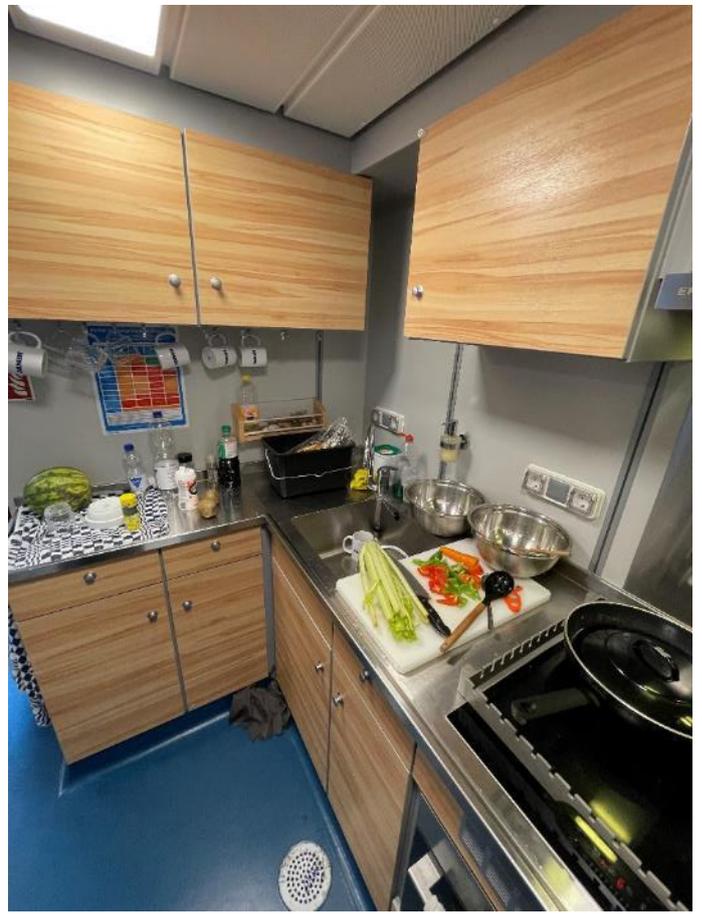




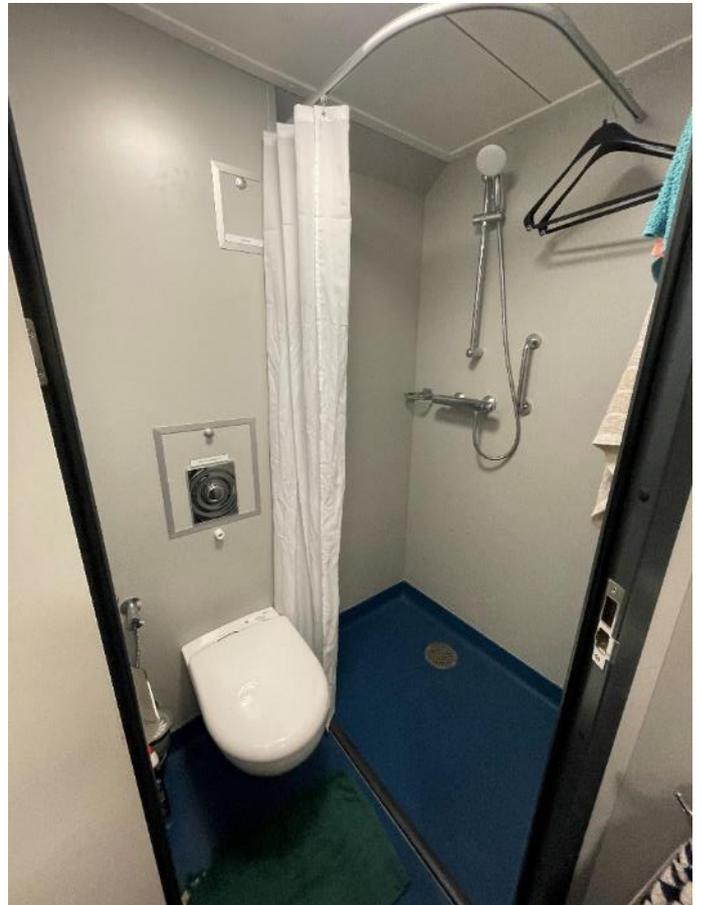


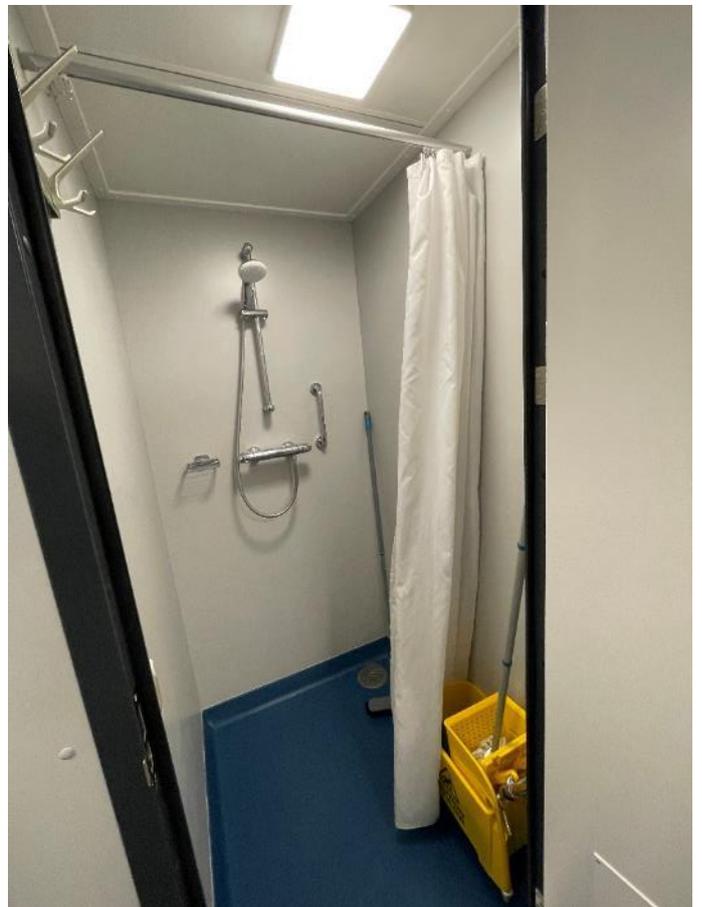
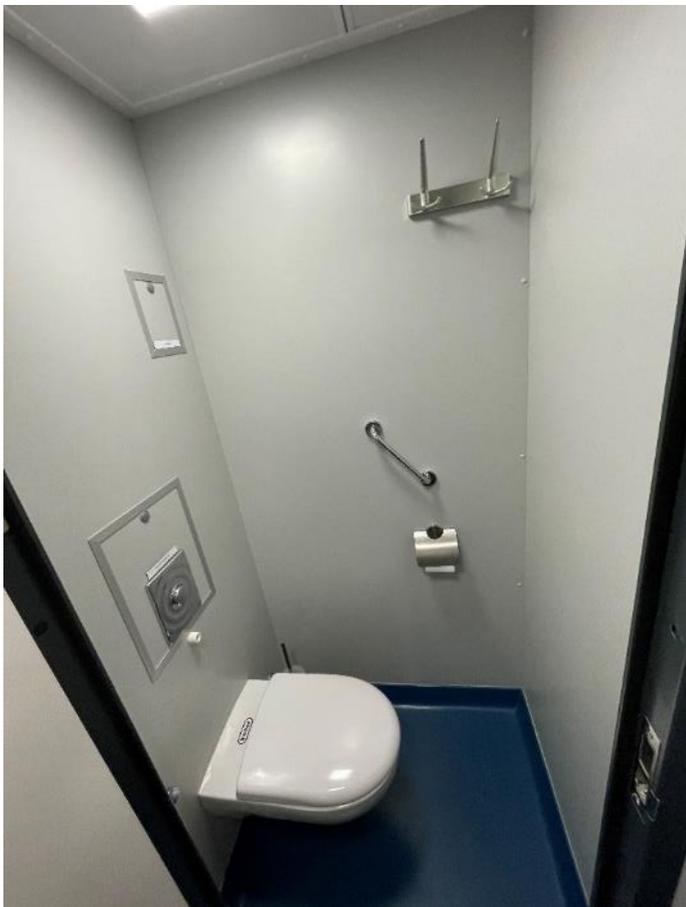


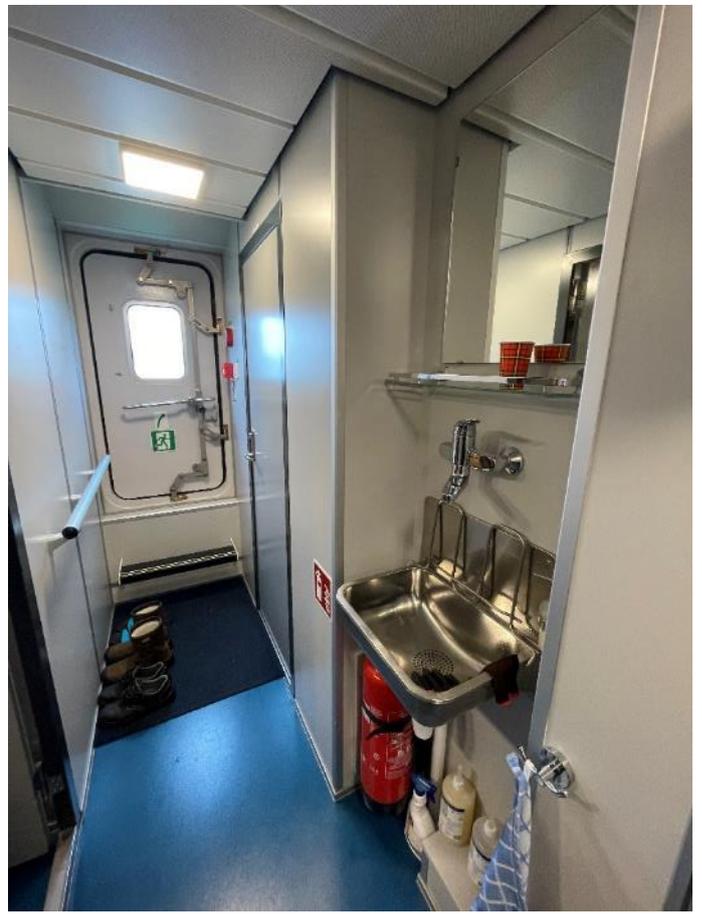


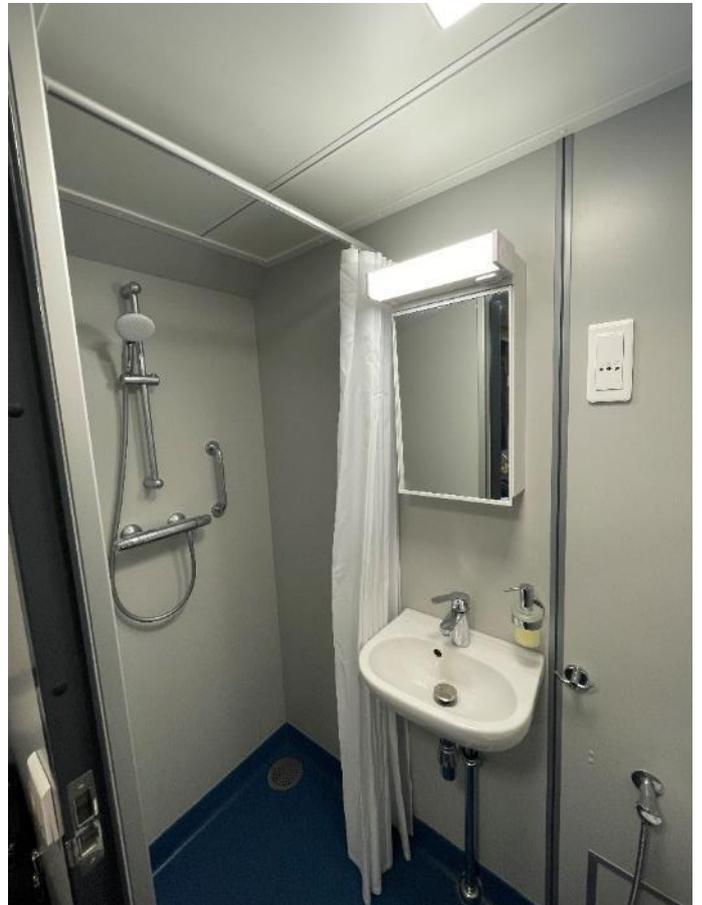


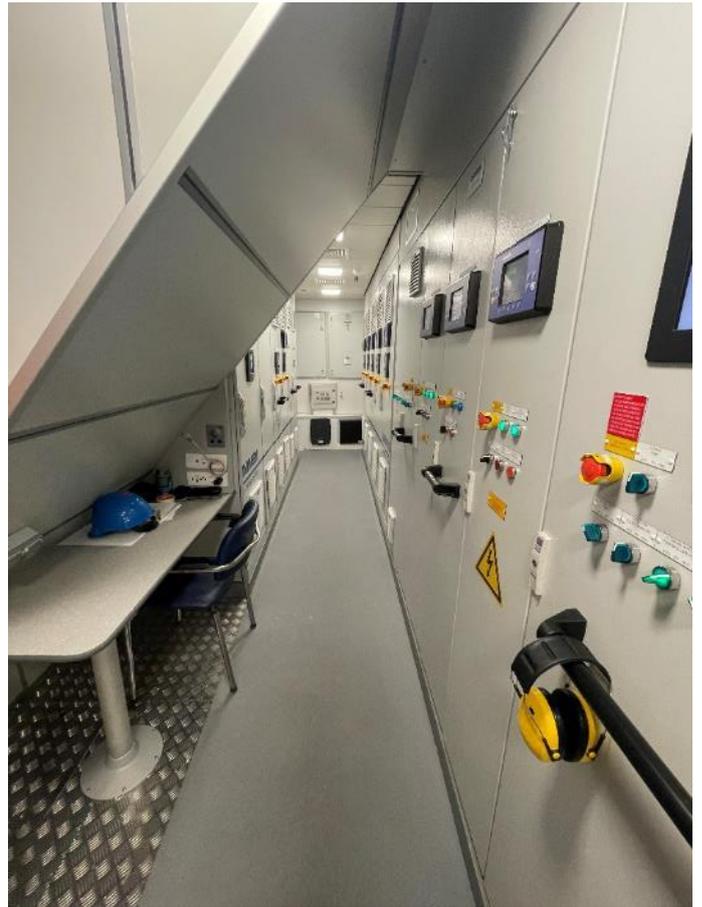
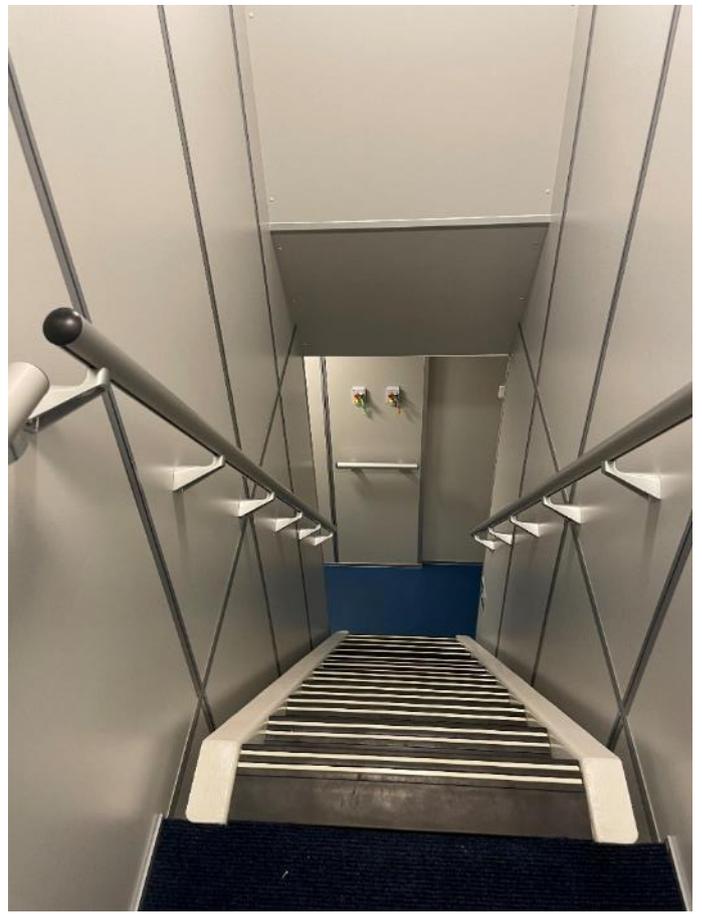
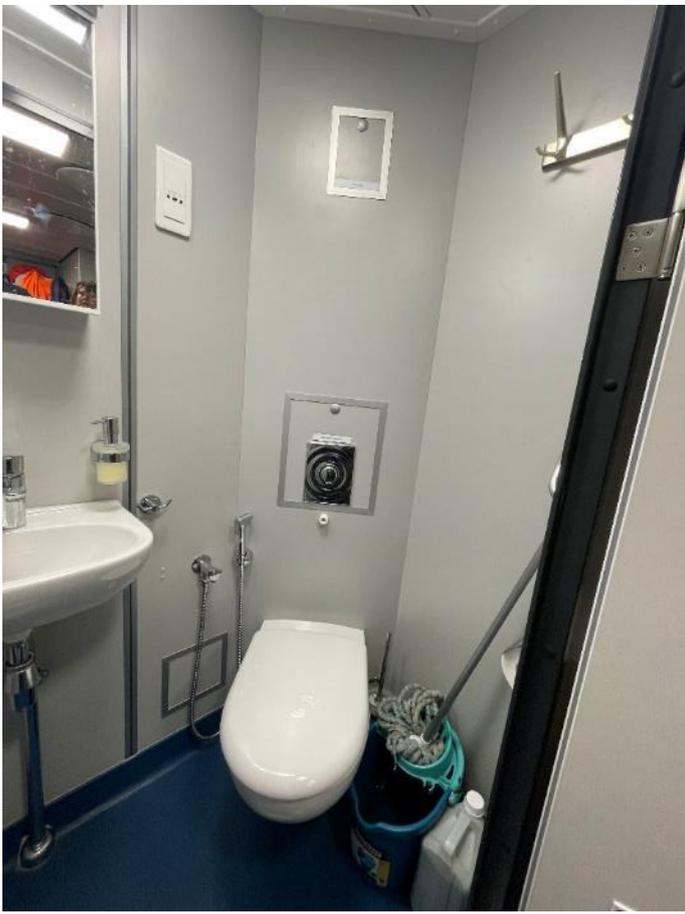


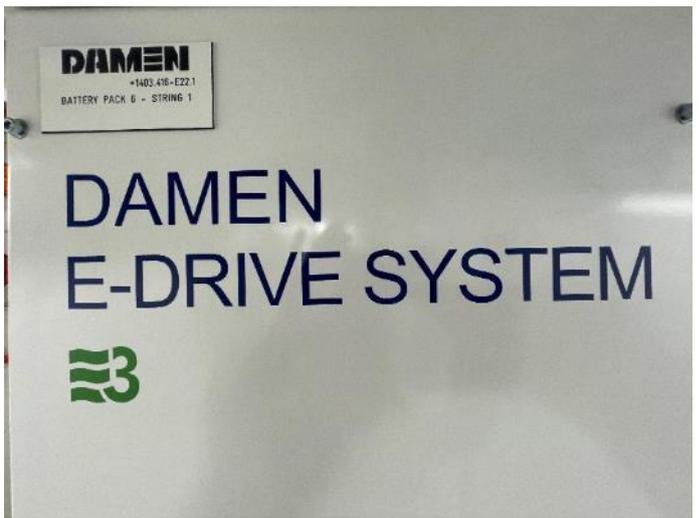
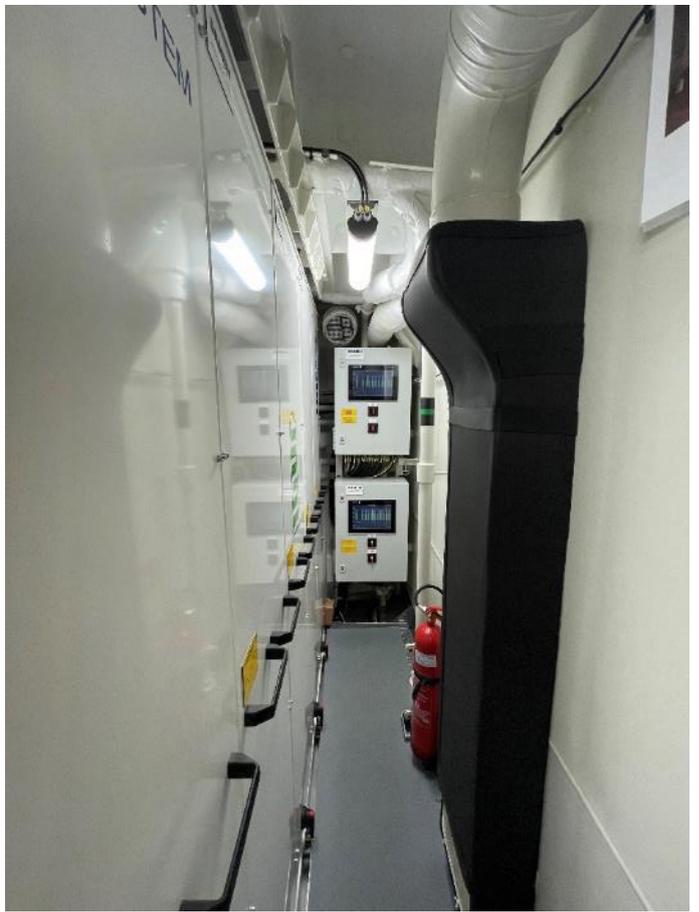










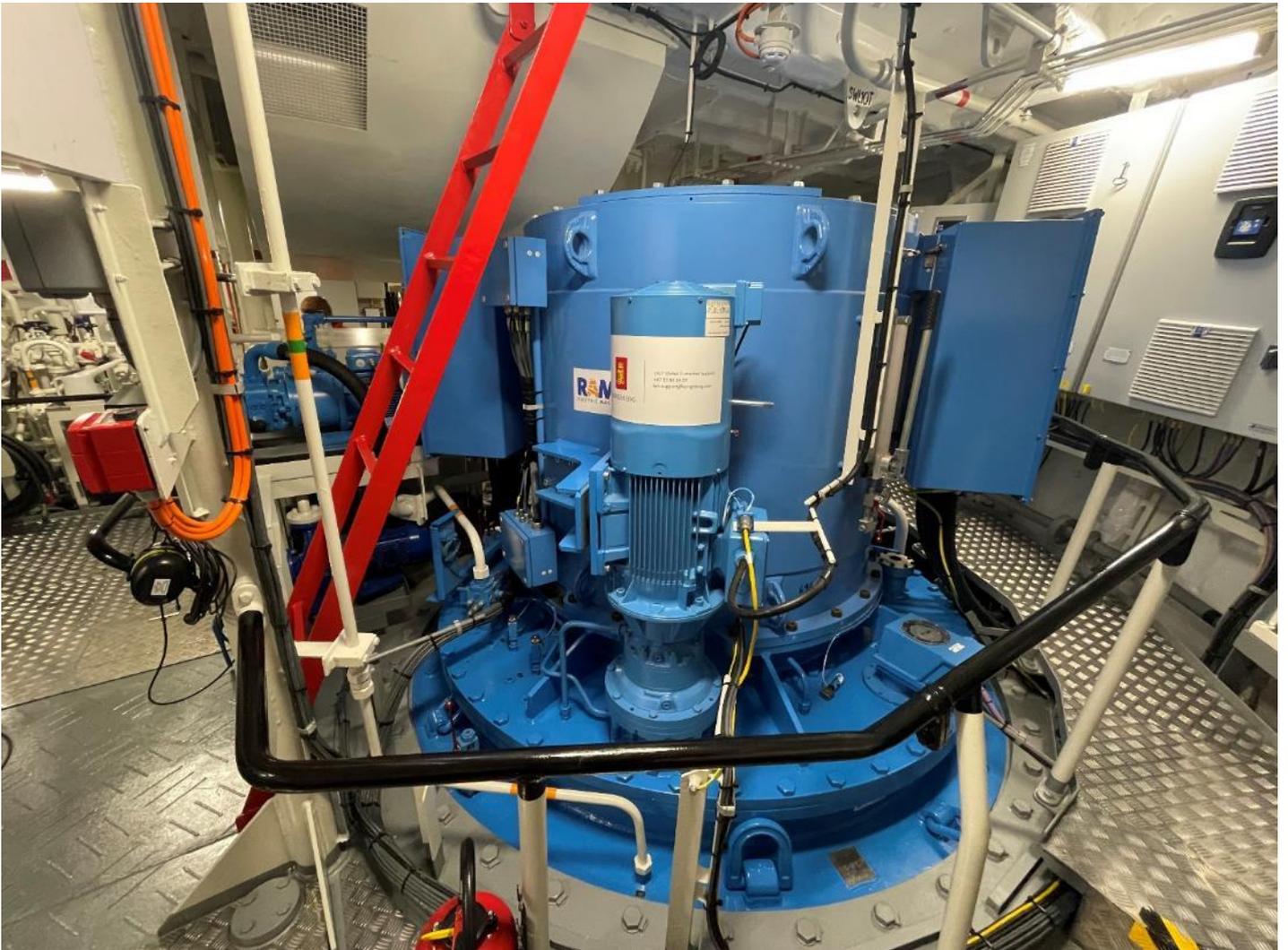




















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