

SERVICE OPERATION VESSEL

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INTRODUCTION

A independent Norwegian ship designer delivering **sustainable solutions** in naval architecture

Designs are tailor made, ensuring that the vessel we design for you, is to the exact specification and requirements for your business needs

World's most extensive design portfolio with a reference to over 4000 vessels built, including some of the most advanced environmentally compliant vessels



VIK • SANDVIK



SKIPS • KONSULENT

CWA
conan wu & associates



SCHIFFKO



WÄRTSILÄ

HISTORY



Since 1955

- Container ships
- OCV & Jack-ups

Since 1971

- Tugs
- PSV & AHTS

Since 1974

- High end offshore vessels
- Fishing
- Research
- Tankers & Merchant



Acquisition into Wärtsilä Ship Design (2006-2008)

- Offshore & service
- Tankers & LNG Bunker
- Merchant
- (Ferries)



Breeze Ship Design established

- October 2020
- Official Agreement to use WSD portfolio
- Fully independent designer



KEY ASSETS

People & skills

- Experienced naval architects
- Enthusiastic entrepreneurs
- Technology experts

Know-how & data of

- 4,000+ vessels built
- 900+ ships in operation
- 20,000+ concept designs

DELIVERING YOU

- Fast and effective naval architecture for various types of ships
- Solutions tailored around your business
- Expert project development and management

SHIPS IN OPERATION



1000+ Ships in operation

450+ Anchor handlers

120+ PSVs

40+ Tugs & workboats

- 400+
 - Cable & pipe layers
 - Construction vessels
 - Fishing vessels
 - Tankers
 - Bulkers

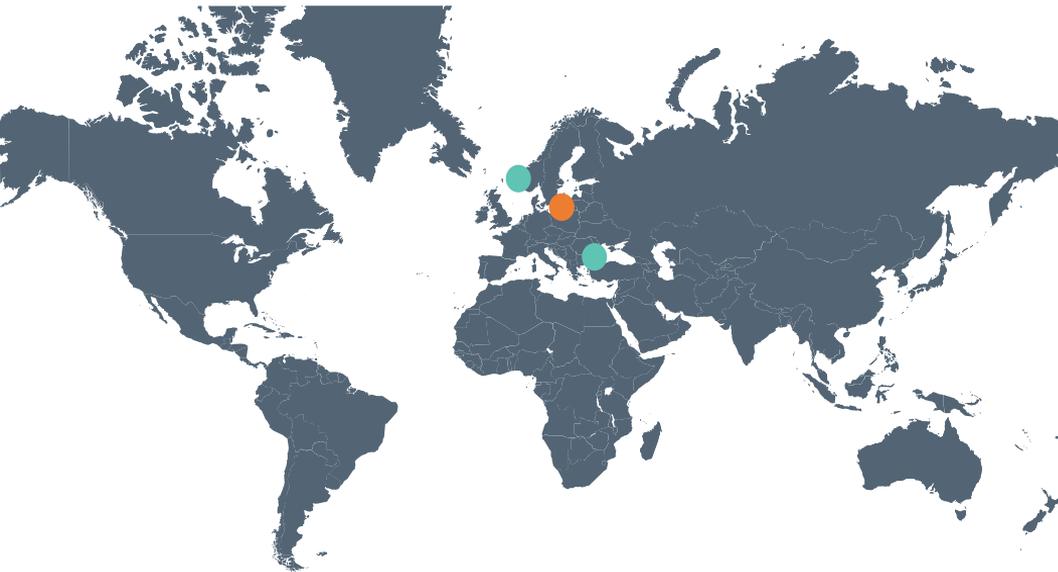
We help shipowners with

- Lifecycle support
- Rules implementation
- Vessels adaptations

Our toolbox

- Original vessels drawings
- Original digital files (stability, structure etc.)
- Designer's knowledge

LOCATIONS



Borggata 8, 5417
Stord, Norway

ul. "Dubrovnik" 54,
9000 Levski, Varna,
Bulgaria

EMPLOYEES



50



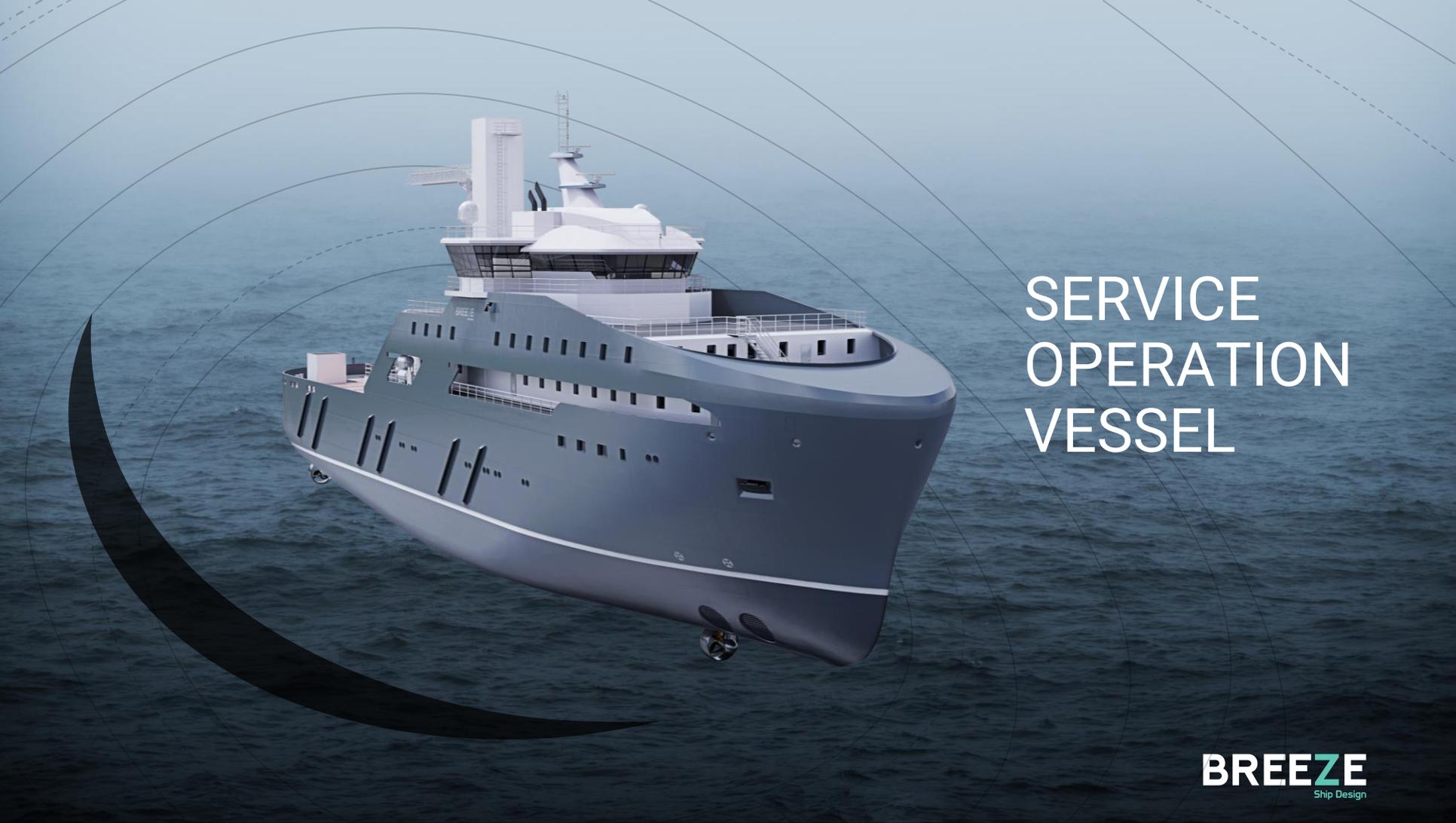
Strategic design partnership for Polish SOV projects.

BREEZE
Ship Design

Vision: Be recognized as
an innovative naval
architect realizing your untapped
ideas

Mission: To accelerate sustainable
solutions in naval architecture





SERVICE OPERATION VESSEL

PRESENTATION CONTENT

1

DECKS & WORKFLOW

- A. Workflow technicians
- B. Recreational area
- C. Workflow cargo
- D. Deck levels
- E. Deck equipment

2

OPERABILITY & MANOUVERING

- A. Gangway workability
- B. Roll reduction tanks
- C. Motion characteristics - roll
- D. DP capability
- E. Navigation & communication
- F. W2W control center

3

GENERAL & CHARACTERISTICS

- A. Technical specification
- B. Vessel views
- C. Main dimensions
- D. Tank capacities

4

MACHINERY & PROPULSION

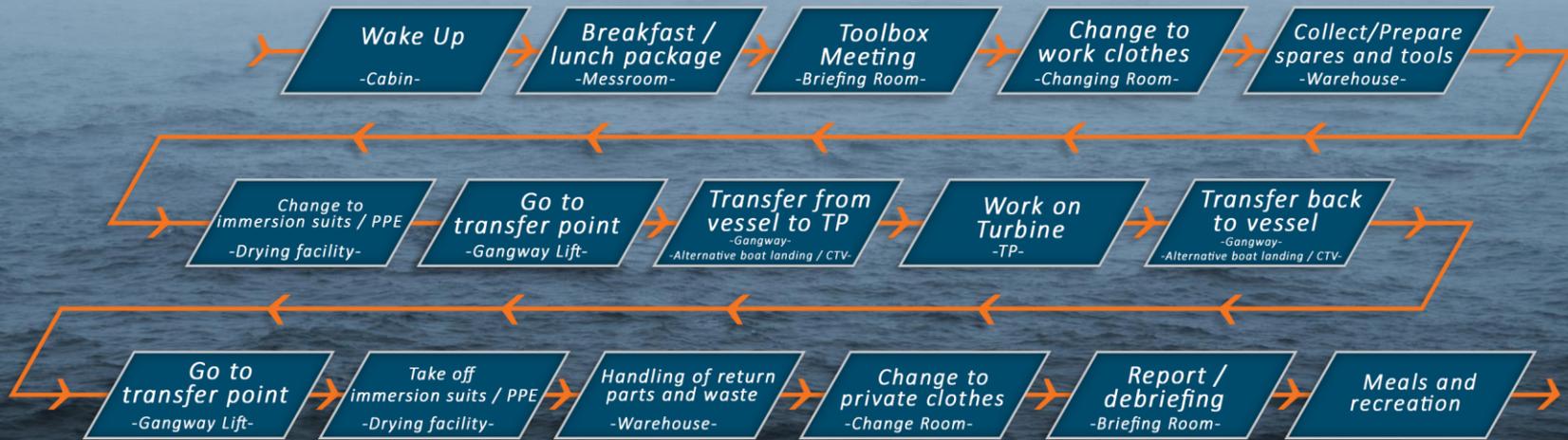
- A. General overview
- B. Single line diagram
- C. Electrical power system
- D. Peak shaving & spinning reserve
- E. Battery & charging (shore & bouy)
- F. Speed & power
- G. Fuel consumption
- H. LNG

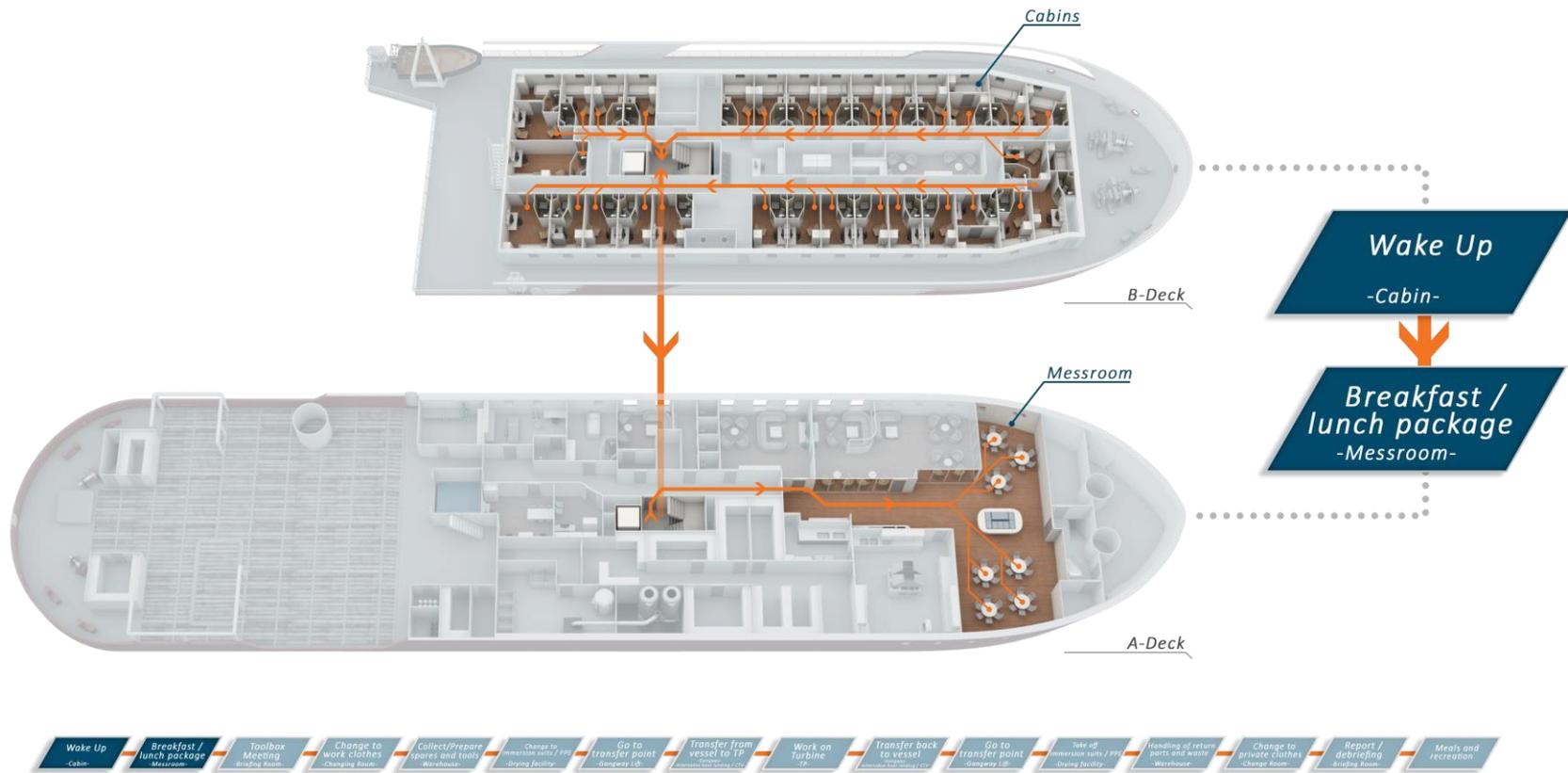
1

DECKS & WORKFLOW

- A. Workflow technicians
- B. Recreational area
- C. Workflow cargo
- D. Deck levels
- E. Deck equipment







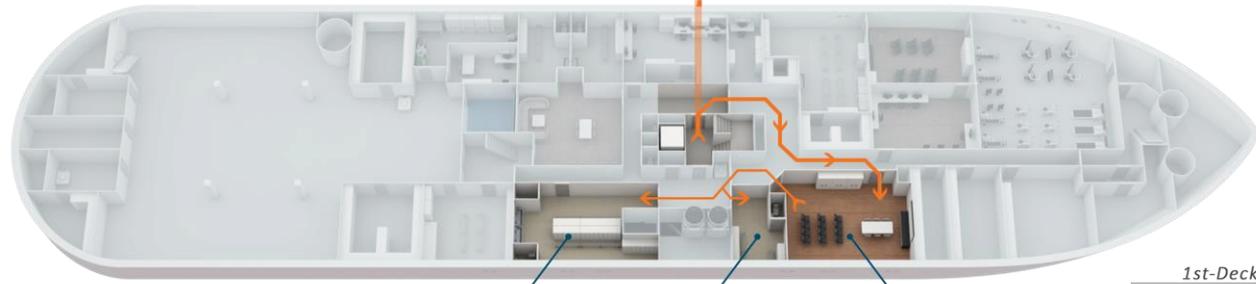


A-Deck

Toolbox Meeting
-Briefing Room-



Change to work clothes
-Changing Room-



1st-Deck

Change room (m)

Change room (f)

Briefing Room





Collect/Prepare
spares and tools
-Warehouse-



Change to
immersion suits / PPE
-Drying facility-

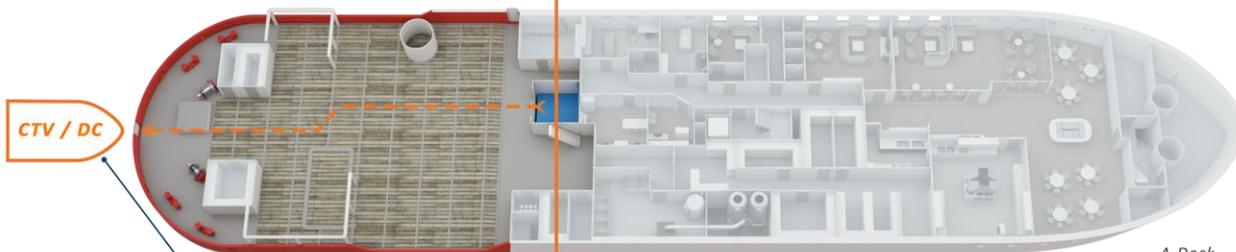


1A

WORKFLOW TECHNICIANS



Top of Gangway



CTV / DC

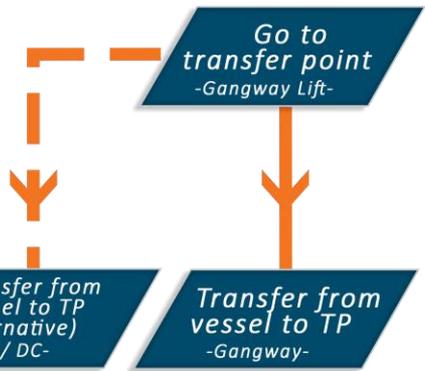
Boat landing

Gangway Lift

A-Deck



1st-Deck

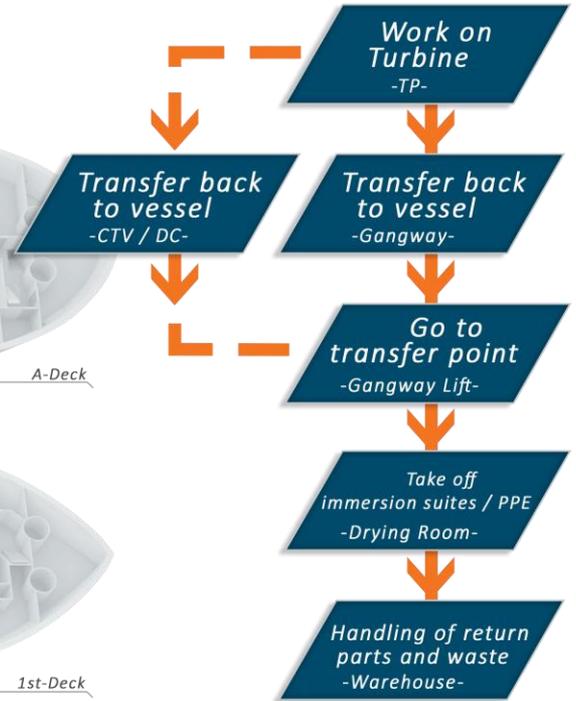
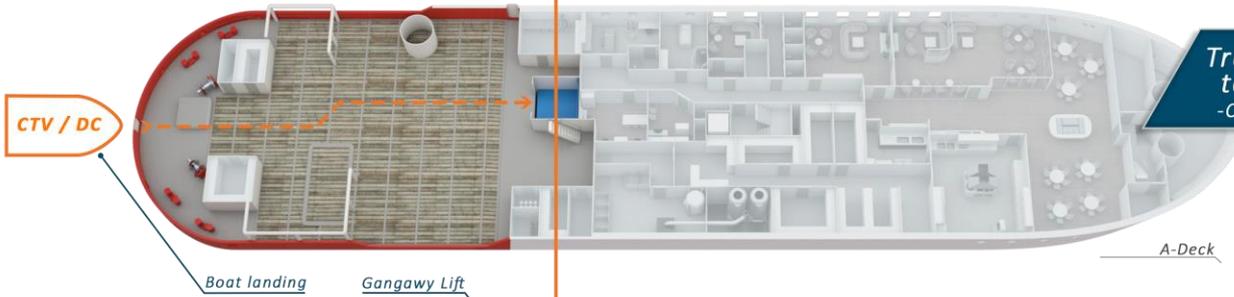


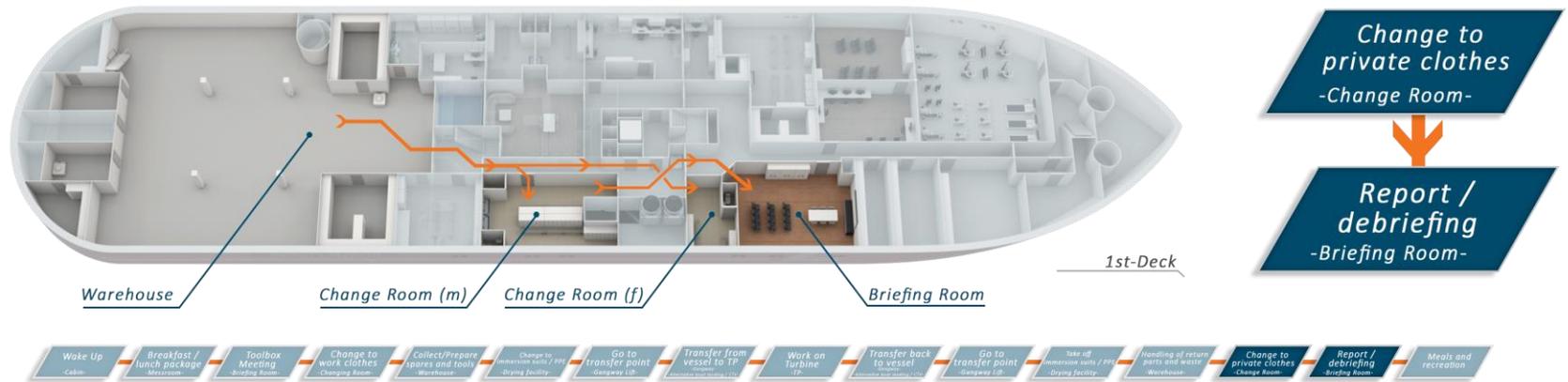
- Wake Up
Cabin
- Breakfast / lunch package
Messroom
- Toolbox Meeting
Landing Team
- Change to work clothes
Changing Room
- Collect/Prepare spares and tools
Workshop
- Change to common safety PPE
Gangway Deck
- Go to transfer point
Gangway LP
- Transfer from vessel to TP
- Work on turbine
TP
- Transfer back to vessel
- Go to transfer point
Gangway LP
- Use of immersion suits / PPE
Living Quarters
- Handling of return parts and waste
Workshop
- Change to private clothes
Changing Room
- Report / debriefing
Briefing Room
- Meals and recreation

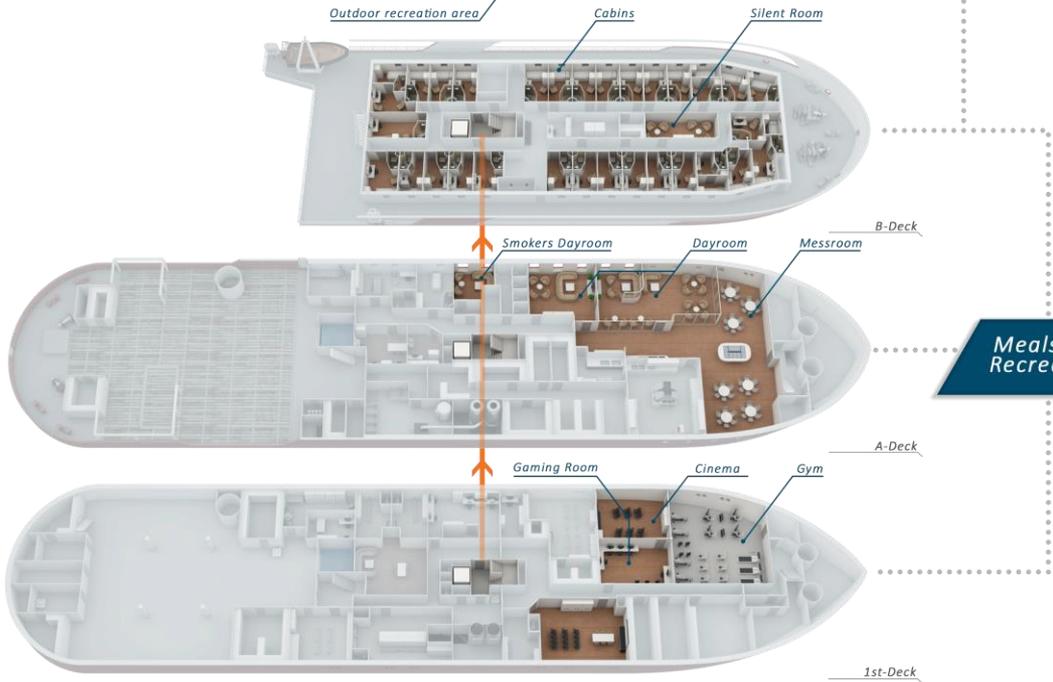
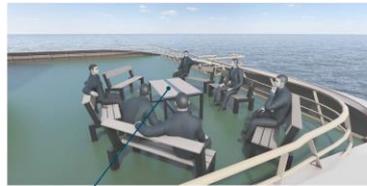
WORKFLOW TECHNICIANS



Top of Gangway







- Wake up
- Breakfast / lunch / dinner
- Headline
- Change to
- Cabin/Prep
- Change to
- Get to
- Transfer from
- Work on
- Transfer back
- Get to
- Time off
- Handling of
- Change to
- Report /
- Meals and

1B

RECREATION – DAY ROOM

Great view

Focus on daylight

Comfortable recreational area



1B

RECREATION – GYM

Spacious training facilities

Versatile training equipment



1B

RECREATION – SERVICE TECH. CABIN

Daylight

Open and bright

High quality



1D

1st DECK

340m² warehouse

Elevator

75m² Gymnasium



Changing rooms
male/female

Briefing room

- Laundry room
- Drying room
- Store keeper & workshop
- Coffee shop / Duty mess
- Gaming room
- ECR

1D

A - DECK

360m² wooden deck

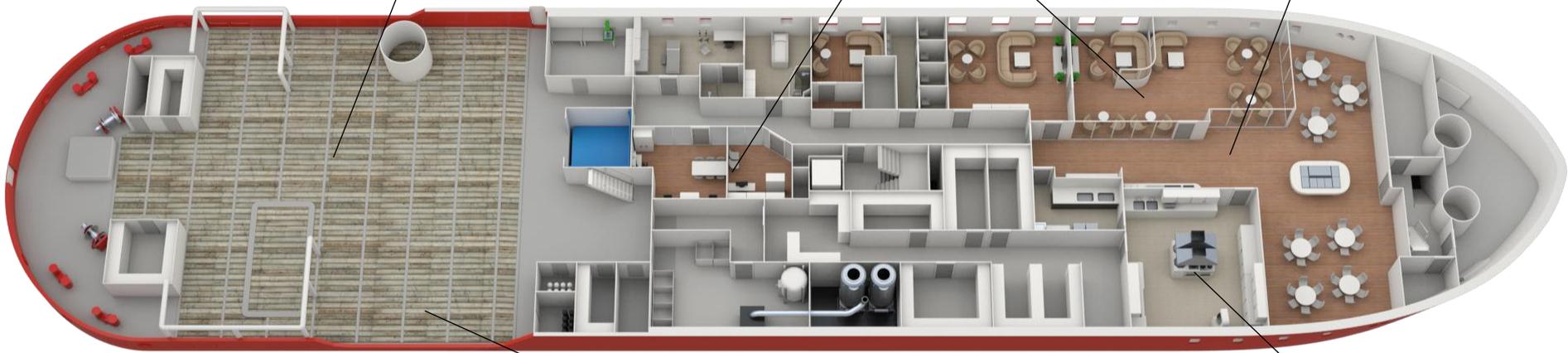
Dayrooms and slop chest

42 seats messroom

Daughter craft location

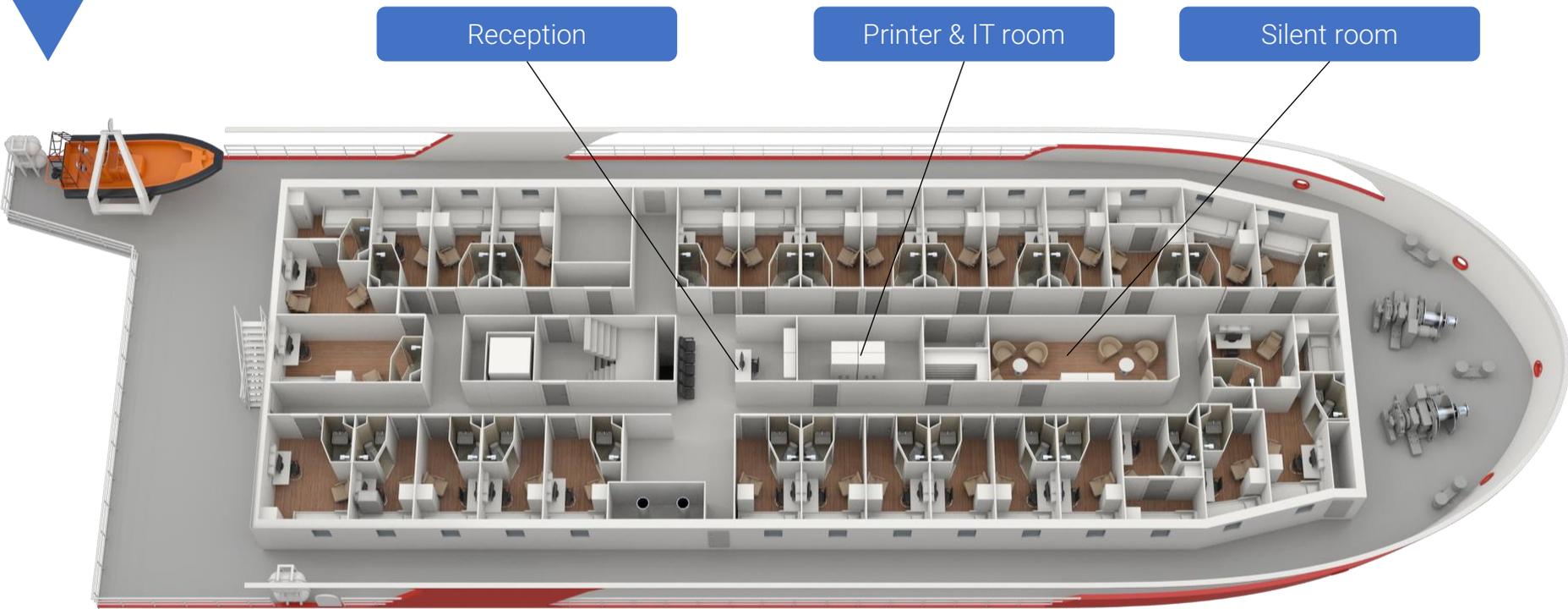
Galley

- Hospital
- Provision rooms
- Storage rooms



1D

B - DECK



Reception

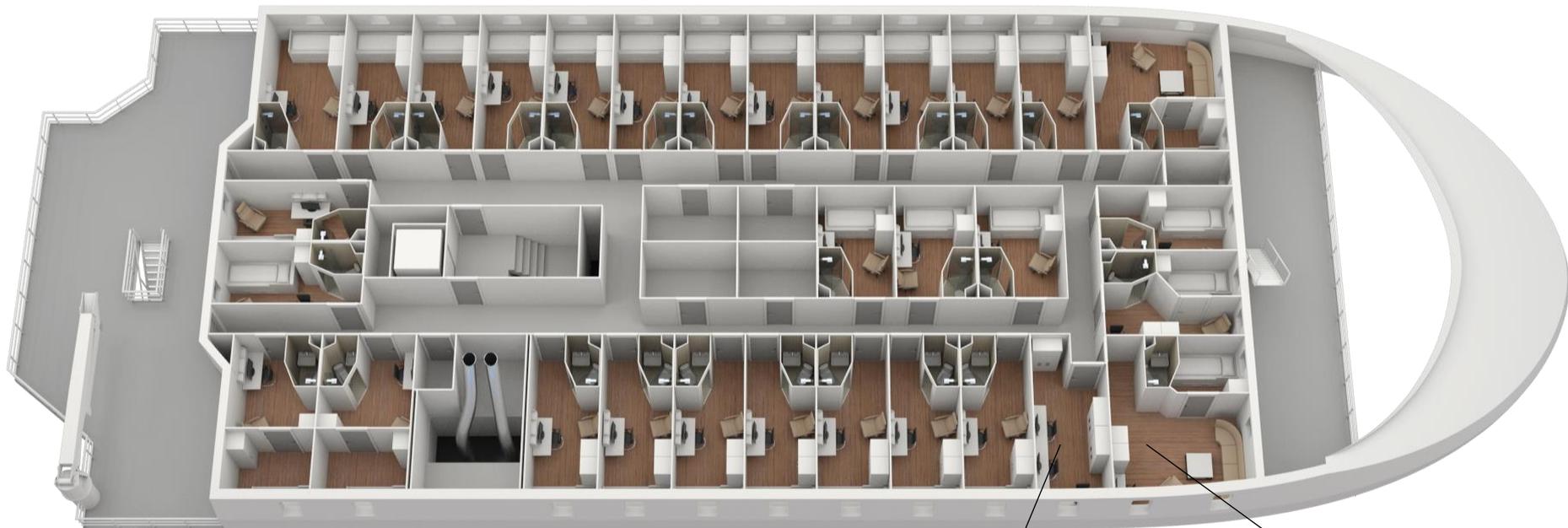
Printer & IT room

Silent room

- FRC
- 30 persons in single cabins

1D

C - DECK



- Provision crane
- 30 persons in single cabins

Ship office

Master

1D

BRIDGE DECK

DP operator

Gangway control

DP operator

Navigation & DP station

Planning & digital twin station



2

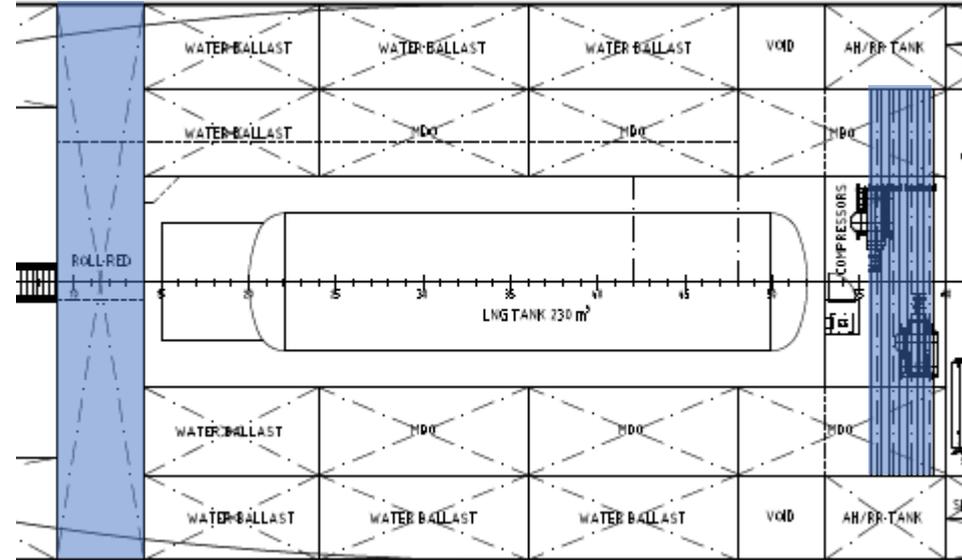
OPERABILITY & MANOUVERING

- A. Gangway workability
- B. Roll reduction tanks
- C. DP capability
- D. Navigation & communication
- E. W2W control center

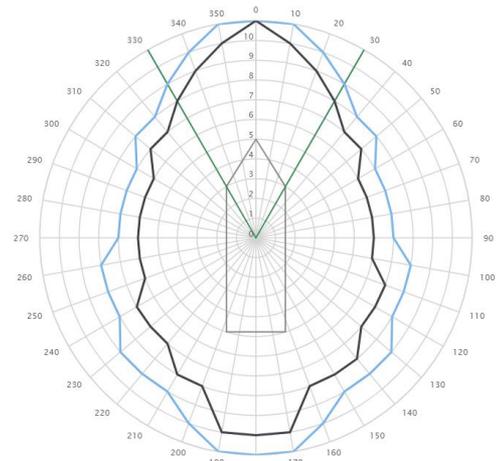


- The gangway is arranged as close to the pitch and roll center as possible.
- Two roll reduction tanks (one passive + one active) offers the master flexibility in optimising the motion characteristics of the vessel.
- Gangway remains operational in conditions up to 2,5 m Hs, 20m/s wind speed for all vessel headings.

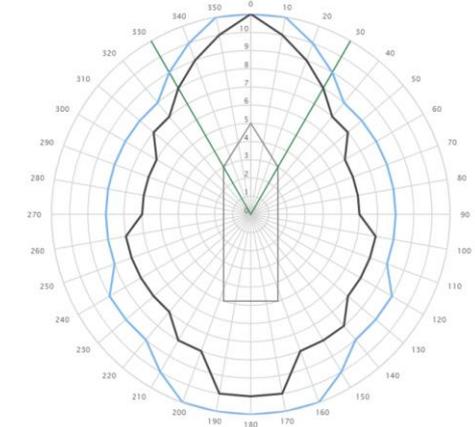
- One passive roll reduction tanks (box-shaped) and one active roll reduction tank (U-shaped) have been arranged to be able to tune the GM-value to be close to the GM-limit curve for any loading condition.
- For the active roll reduction tank water is transferred from side to side by means of air pressure or vacuum system. In such case an air compressor to be either: Arranged on one side (pressure/vacuum) or both sides (pressure) of the U-tank.
- The U-tank is also suitable for use as an anti-heeling tank.



- For the Open bus analysis the calculations gave results of DP Capability L2 (9, 7, 8, 6).
- For the Closed bus analysis the calculations gave results of DP Capability L2 (9, 8, 8, 6).



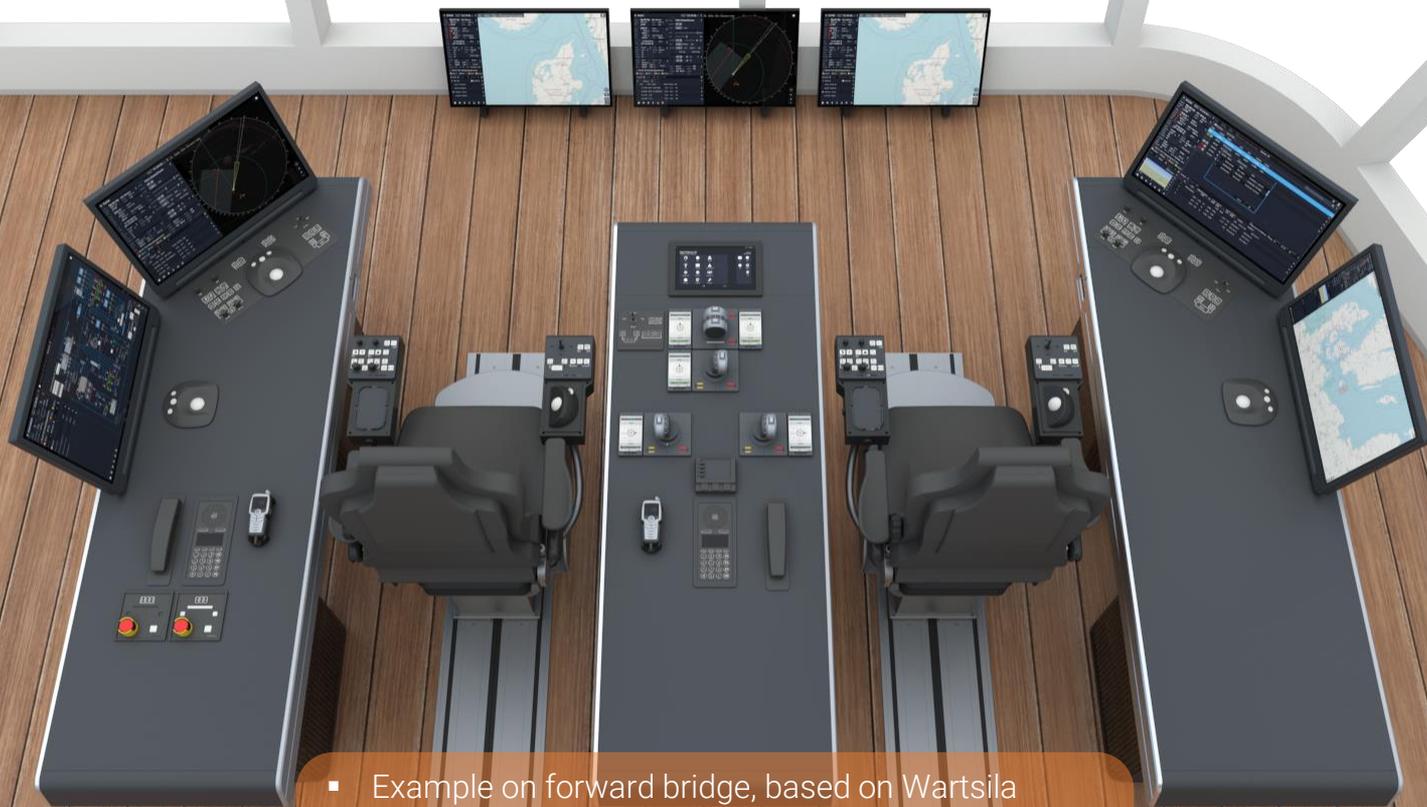
Open



Closed

Intact

Combined worst case single failure



- Example on forward bridge, based on Wartsila solution.
- All in compliance with rules and regulations as described in vessel specification.

2D

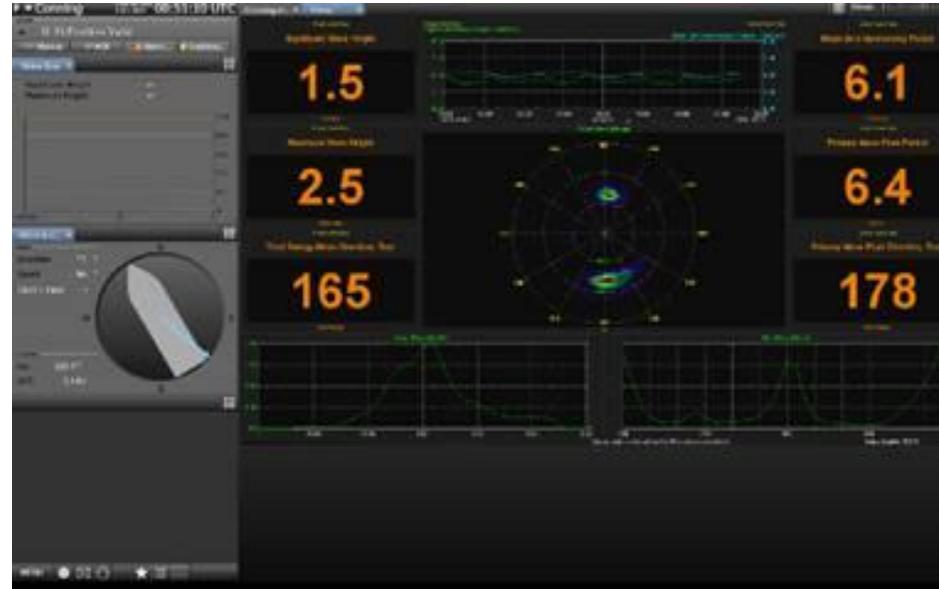
NAVIGATION



- SceneScan sensor is a sensor that doesn't use reflector targets.
- When approaching a scene, it scans the environment and tracks.
- Benefits:
 - Additional independent DP reference sensor
 - No targets required
 - Designed for close proximity
 - Automatic reference point selection
 - Maximum uptime from rotor design
 - Modular sensor design aids in-vessel servicing
 - No prisms, no maintenance
 - Robust construction - high performance in all weather conditions and sea states

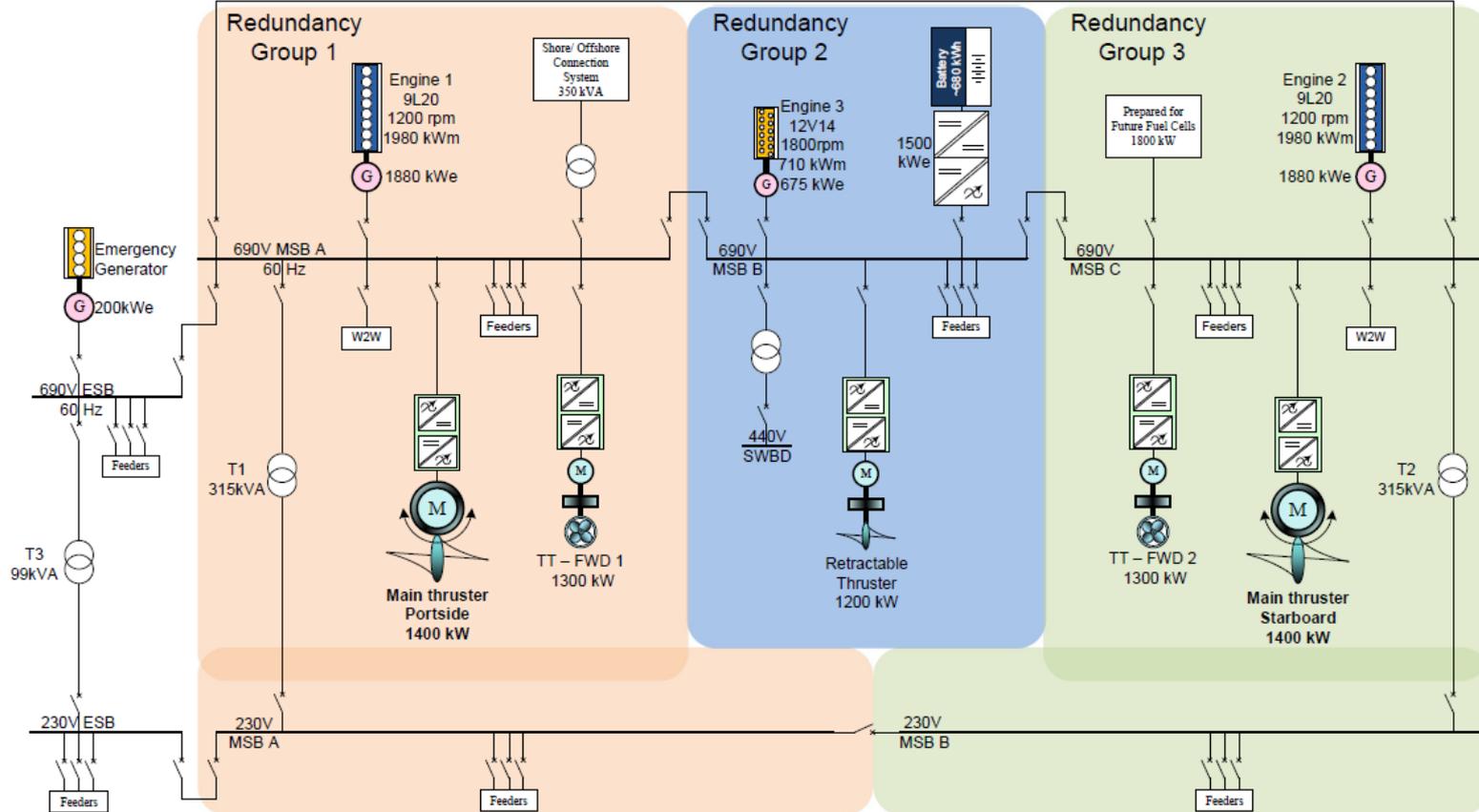


- The X-band radar-based wave and current monitoring system.
- Wavex® captures and processes sea surface backscatter data from a standard X-band marine navigation radar.
- Wavex® calculates and displays directional wave and surface current data.
- Wavex can use an already installed or dedicated X-band navigation radar.



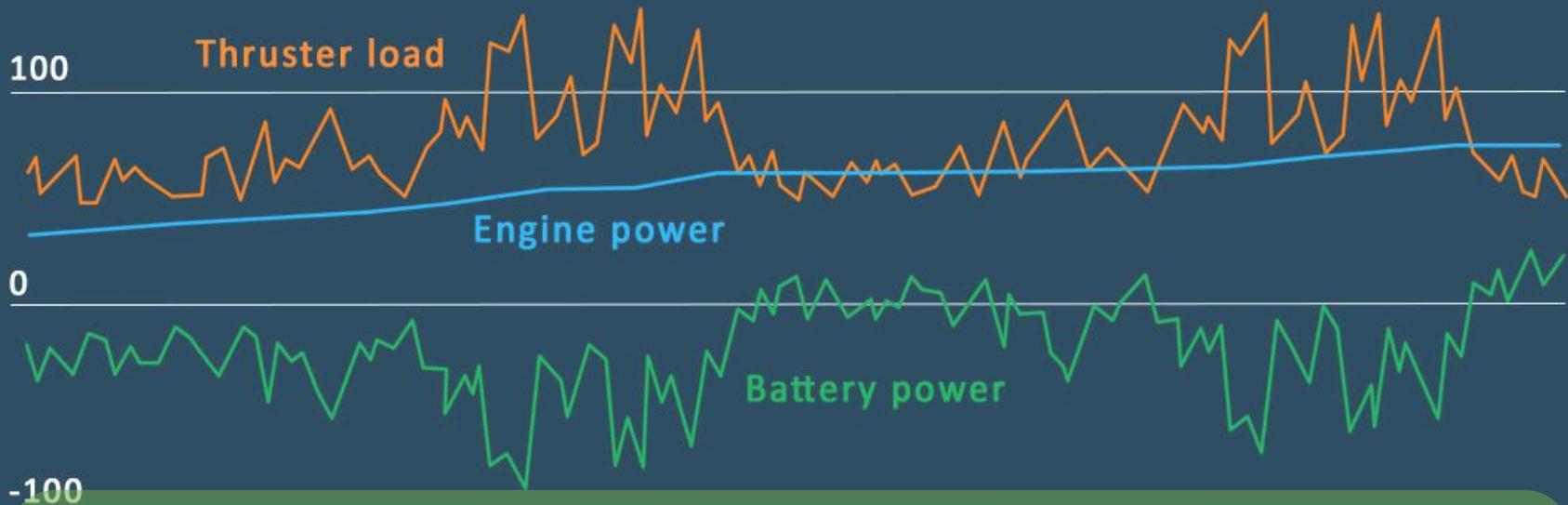


Three split switchboard system connected in a ring



- Three split switchboard system connected in a ring divided by bus tie breakers which gives a optimum setup for low consumption and high redundancy & flexibility.
- Switchboard divisions result in multiple redundancy groups (as shown in single line diagram).
- Vessel design, switchboard etc. is also prepared for future zero-emission solution (e.g. Fuel Cell Hydrogen/Ammonia)





- The vessel will be fitted with a battery system for peak shaving of generator loads, but also act as a "generator", (spinning reserve) maintaining redundancy requirements during DP operations.
- The battery system included will also give significant emission reduction (assuming 15-20% for the total operation profile).

- Figure to the right shows an example from a traditional set-up with diesel engines.
- Multiple engines are then required to be operational to fulfil redundancy requirement, resulting in poor efficiency, emission profile and suboptimal fuel consumption.

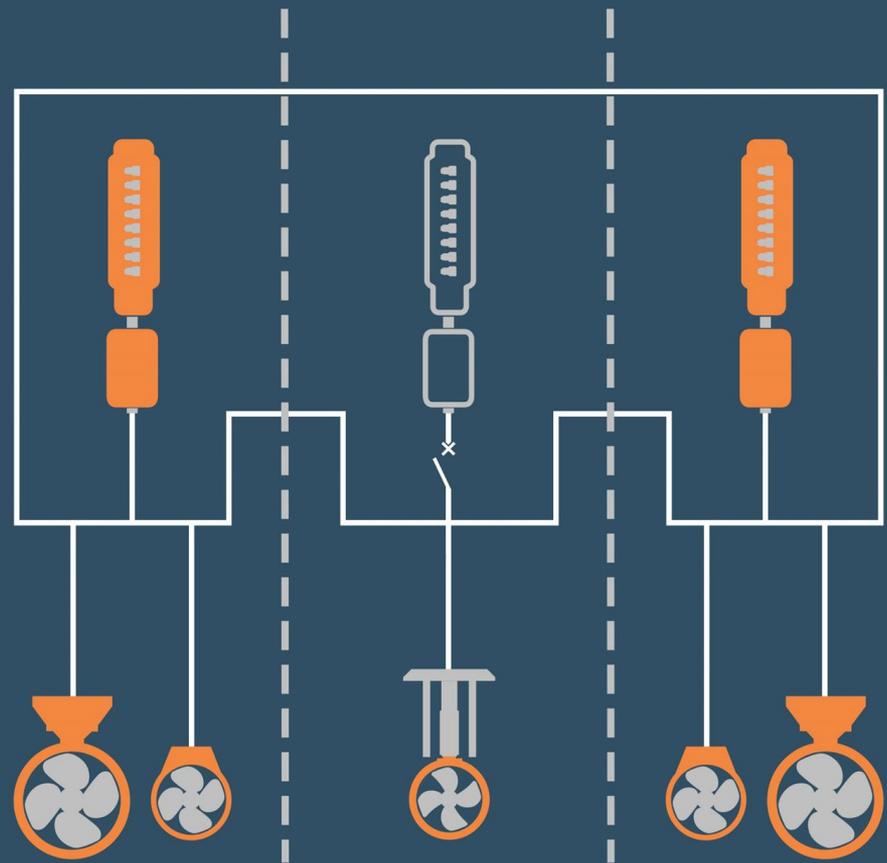


Figure: Low Load Traditional

- Batteries, with necessary capability to safely terminate the DP-operations, are then acting as reserve power sources, allowing higher loading and stable operation of the engine, improving both energy efficiency and the emission profile.

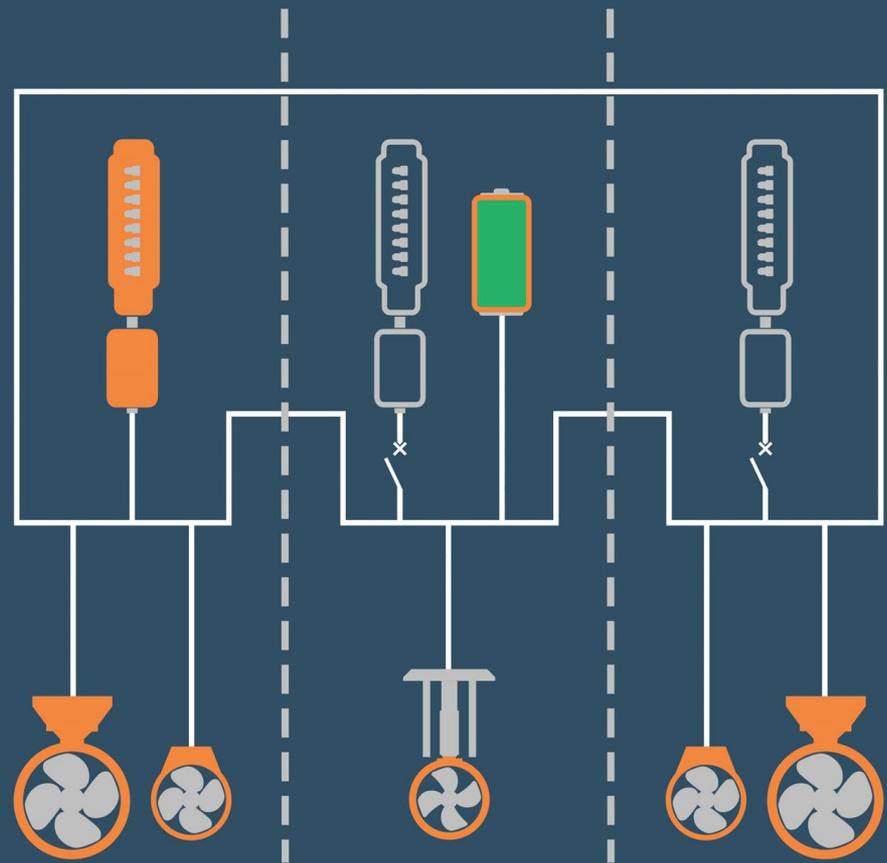


Figure: Low Load, Spinning Reserve

COST EFFICIENCY

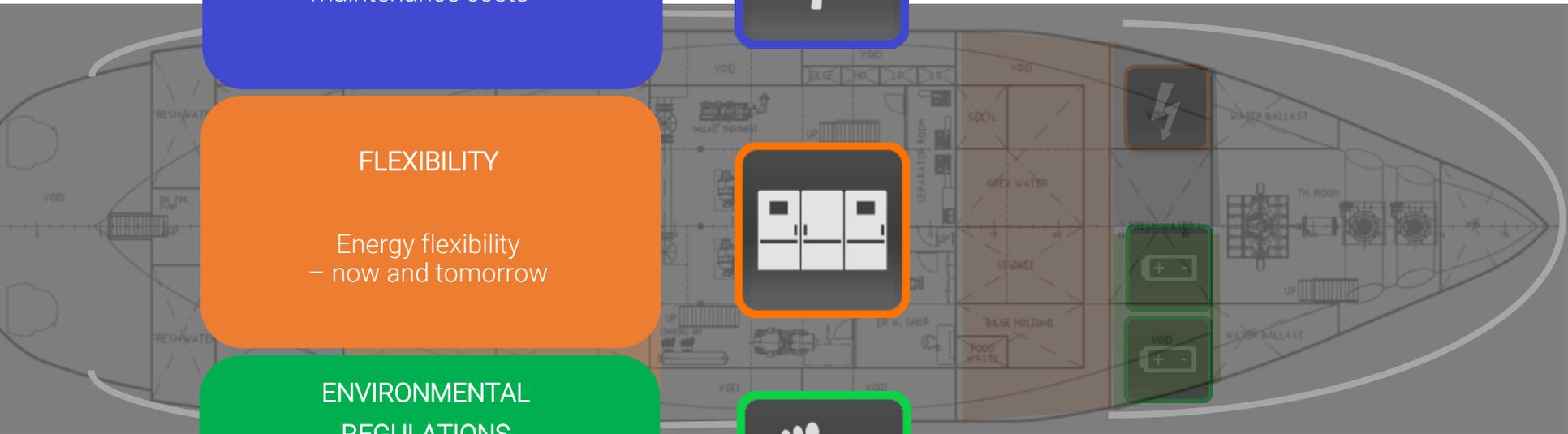
Lower operating and
maintenance costs

**FLEXIBILITY**

Energy flexibility
– now and tomorrow

**ENVIRONMENTAL
REGULATIONS**

Reduced emissions
– future environmental
compliance



REFERENCES – VIKING WIND POWER



REFERENCES – WIND INNOVATION



REFERENCES – NORSIDE CYGNUS



WHY BREEZE?

- Our team combines people of various backgrounds and extensive track record within the maritime industry
- The world's most extensive design portfolio comprising of both tailor made highly innovative designs
- Our unique expertise, knowledge a reference to over 4000 vessels built, including some of the most advanced environmentally compliant vessels
- Provide a wide range of services from feasibility studies, conceptual designs, initial designs, basic designs and detailed designs

BREEZE

Ship Design

Sustainable naval architecture