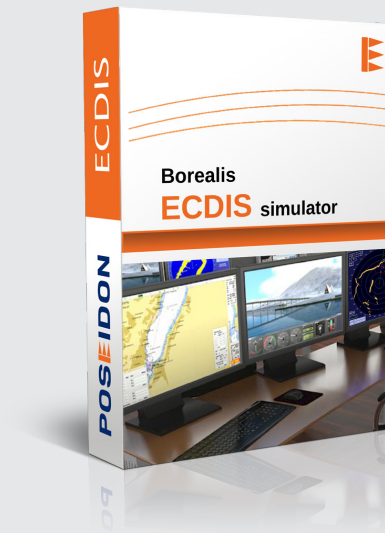# BOREALIS

Poseidon Borealis Navigational Simulator

2023
Product Brochure

POSEIDON
SIMULATION

Borealis Navigational Simulator

Empowering maritime education worldwide

Thank you very much for your interest in Poseidon Simulators. Poseidon has offered simulators since 1989 and has since then been one of the world leading suppliers of simulators and teaching aids for maritime training. Poseidon has a design philosophy of making an "open standard" for out simulator systems. This means that we prepare our software for not only integrated bridge systems (IBS) but with new standards, new components and external simulators. In a rapidly evolving technology is it important to us that our products are adaptable to the needs of every customer, and we are allways making sure our solutions are consistent and reliable.

NAVIGATION SIMULATOR

POS**E**IDON

1 Instructor

1.1 Exercice Manager

The primary software module in the Poseidon Borealis bridge Simulator System is Poseidon Exercise manager (PEM). This software module is the network server as well as the instructors interface for preparing and running exercises. The system runs under Windows OS and on standard COTS PC's. The instructors interface for all preparation and monitoring is ECDIS-based chart view. Using modern Windows dialogue boxes in combination with internationally recognized chart symbols gives the instructor an intuitive overview of complex training scenarios.

1.2 Maneuvering Manager (Optional)

The Poseidon Maneuvering Manager (PMM) is a individual software module where the instructor controls mooring operations as well as anchoring. The instructor has a bird's eye view of the ships and piers with bollards and mooring lines. This allows a close inspection on load on mooring lines as well as anchor chains. Too much tension on the mooring lines will make the lines break.

1.3 Databases and ships

All Own Ships can be used as Target Ships and it is possible to insert an unlimited amount of Target Ships in an exercise. We use the hydrodynamic modeling developed by The Swedish Ship Research Institute (SSPA), which provides high realism on physical effect on the ship's hull. We can also provide custom ship models to fit each customers individual needs.

In addition to Target Ships we also provide a database of other fixed targets such as marks, buoys and light ships. We also provide other obstacles such as rafts and persons in water. We have a number of visual sailing areas that the instructor can select for greater diversity in the training course. We're also able to provide custom areas on request. The sailing area contains navigational marks according to native maps, cultural objects and main ports. The ports and ships are subject to specific license and are a part of the PEM software.

Exercise Manager

Maneuvering Manager

Ship Model Neftgaz
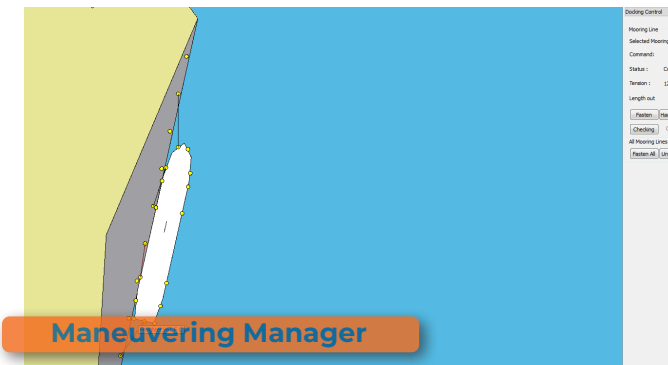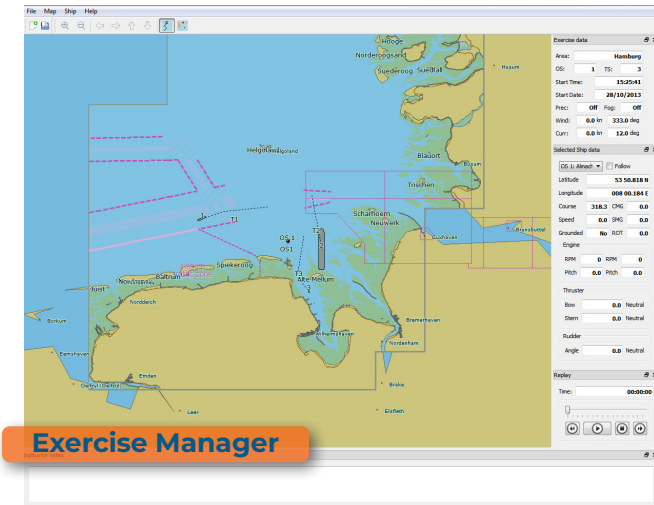
1.4 Included elements

In addition to visual elements, the following is included in the software:

- • Coast line, coherent with the navigation chart and radar data
- • Shore line in profile
- • Navigational markers highlighting significant points of interest
- • Mainland infrastructure
- • Mooring lines and buoys
- • Berths (w/ piles, fenders and bollards)
- • Responsive sea surface rendering based on wind, current, Beaufort scale number and the motion of Own Ship
- • Fast texture rendering
- • Weather effects such as fog, haze and rain that affects visibility
- • Navigation aids: buoys, lighthouses, lights and other markings included in the charts.
- • Traffic Ships and Own Ships
- • Realistic and responsive interaction between Own Ship and Traffic Ships
- • Visible parts of the own ship will be shown fully textured
- • Multiple student stations in one simulated scenario

1.5 Instructor Station Features

Instructor can stop, start or pause the simulation during any point, and save certain situations as a new exercise. This not only allowes for important repetition of key scenarios, but also facilitates longer exercises over multiple lessons. The instructor can introduce rain and snow at different levels which will affect visibility and test students ability to navigate on instruments only.

View at night

Harsh weather conditions

Expanded field of view

1.6 Operational characteristics

The simulator complies fully* with STCW'10 Regulation Chapter II, I/12,
and will be suitable for the following training objectives:

A-II/1.1	-	Plan and conduct a passage and determine position
A-II/1.2	-	Maintain a safe navigational watch
A-II/1.3	-	Use of radar and ARPA to maintain safety of navigation
A-II/1.4	-	Use of ECDIS to maintain the safety of navigation
A-II/1.5	-	Respond to emergencies
A-II/1.6	-	Respond to a distress signal at sea
A-II/1.8	-	Transmit and recieve information by visual signaling
A-II/1.9	-	Maneuvre the ship
A-II/2.1	-	Plan a voyage and conduct navigation
A-II/2.2	-	Determine position and the accuracy of resultant position fix by any means
A-II/2.3	-	Determine and allow for compass errors
A-II/2.4	-	Co-ordinate search and rescue operations
A-II/2.5	-	Establish watchkeeping arrangements and procedures
A-II/2.6	-	Maintain safe navigation through the use of information from navigation equipment and systems to assist command decision making
A-II/2.7	-	Maintain the safety of navigation through the use of ECDIS and associated navigation systems to assist command decision making
A-II/2.10*	-	Maneuvre and handle a ship in all conditions
A-II/3.1	-	**Plan and conduct a coastal passage and determine the position**
A-II/3.2	-	**Maintain a safe navigational watch**
A-II/3.3	-	**Respond to emergencies**
A-II/3.4	-	**Respons to a distress signal at sea**
A-II/5.2	-	**Contribute to berthing, anchoring and other mooring operations**

The simulator also supports the following IMO Model Courses

|		
IMO 1.22	-	Ship Simulator and Bridge Team Work
IMO 1.08	-	The operational use of ARPA
IMO 1.07	-	Radar observation and plotting

*A-II/2.10 has only limited compliance

2 Students

2.1 Conning Display Module

The instruments and displays are simulated in the software module called Poseidon Virtual Console (PVC). In the PVC software module, all relevant analogue and digital instruments and repeaters are available and configured according to the hydrodynamic ship model chosen. Instruments and indicators that are simulated are:

- Rudder control lever
- Rudder mode
- Wind
- Dim
- LOG
- Rudder angle
- ROT display
- Auto pilot
- Engine control lever
- Tachometer
- Propeller pitch
- Ship's speed
- Bow and stern thruster lever
- Bow and stern thruster repeater
- Magnetic compass

- Satellite compass
- Gyro compass
- Loran-C
- GPS
- RDF Radio Direction Finder
- Time
- Log
- Wind instrument
- Echo sounder
- Visual control
- Light controls
- Day signals
- Sound signals control
- AIS display

PVC and PDR display
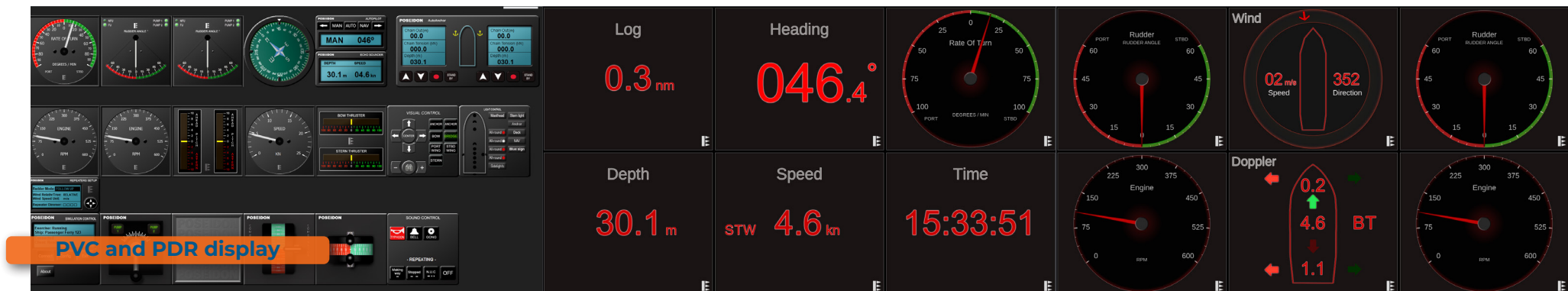
2.2 Radar/ARPA Simulator Module

The Poseidon radar/ARPA simulator module (PRS) is STCW'10 compliant and contain all the relevant radar and ARPA features. The IMO requirement for commercial ships is to have two fully working radars (X-band and S-band) on the bridge. We therefore recommend that a 360 degree Full Mission Bridge shall have two radars. PRS can be configured to operate either as X- or S-band radar. The radar can be fully operated on-screen using a 3-button roller ball. In addition the radar has a hardware control panel containing the most relevant radar controls.

Radar functions:

- Performance Monitor
- Tuning
- Signals controls
- Video Boost selector
- Pulse length selector
- Range Scales
- Range rings
- Screen Mode of Operation
- Relative Motions (RM)
- True Motion (TM)
- North Up
- Head Up
- Course Up
- Heading line
- Offset
- Electronic Bearing Line
- Variable Range Marker
- Parallel Index
- CRT (Adjusting contrast and brilliance)
- Day/Night vision
- Own Ship and Plotting Parameters
- Target Data
- STAB
- VECTOR
- TRAILS
- CPA alarm setting
- D TCPA

ARPA - Functions

- Manual Plotting
- Automatic Plotting (Guard Zone
- Exclusion Zones(s)
- Vector Mode
- Target History
- Labels
- Fixed Targets
- Autodrift
- REF TGT.
- TCPA/CPA Limit
- BCR/BCT
- ARPA Alarms
- Trial Maneuver
- Delay
- Trial Coursre/Speed
- Mapping

PPI presentation:

- Day/night illumination
- Gain, Sea Clutter
- Rain Clutter
- Echoes
- Radar Beacon (Racon)
- SART
- Interference
- Blind sectors

MARIS Radar
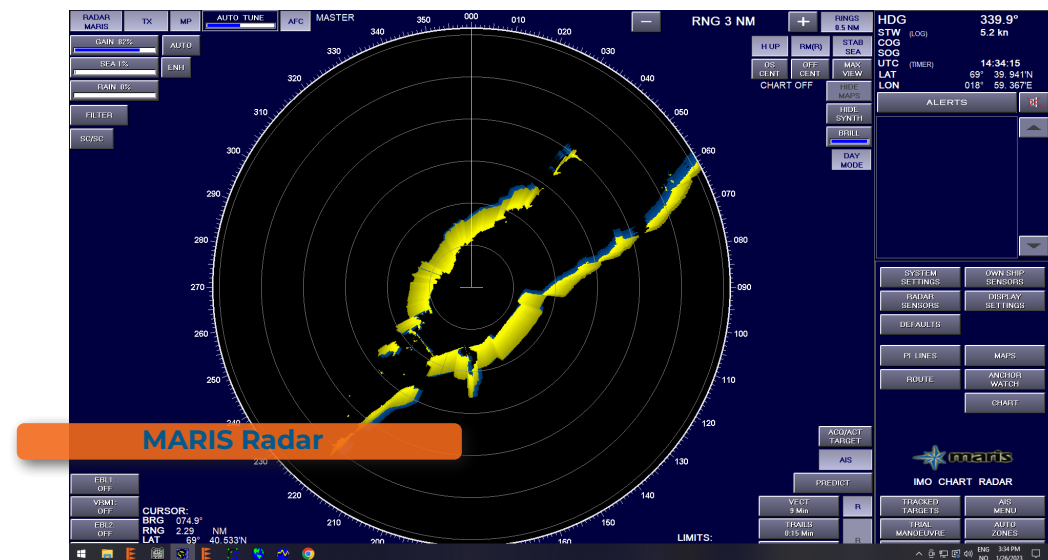
2.3 ECDIS

Our simulator has the ability to intergate ECDIS900 from Maris. This is highly recommended for a realistic and effective simulation. MARIS was among the first companies to get IMO classification for a PC-based ECDIS system. The ECDIS satisfies the performance standards adopted by IMO resolution A.817 and has the following fuctions, among others:

Chart information display:

- Chart database: IHO S57 Vr 3.0, C-MAP CM93, ARCS, NOAA
- Official ENC; Primar. Charts (HR) for the coast of Croatia
- C-MAP ENC Display mode: True motion display, North up display
- Zoom up/down: 1/100 - 1/200,000,000

Navigation planning

- Entry, deletion and modification of planning
- App. 200 way-points per route
- Grounding alarm and dangerious/prohibited area alarm functions for route editing
- Navigation data calculation

Route monitoring

- Monitoring for prohibited area and safety contour crossing
- Monitoring for prohibited area entering
- Monitoring for deviation from the route
- Monitoring for arrival at way-point and for deviation from fixed point
- Other ships monitoring with AROA targets information

2.4 Navigation Log

ECDIS900 will log position, time, heading course and velocity for the entire route on the AIS interface. Incoming AIS messages are displayed on the ECDIS UI where you can read all available ship data. MARIS ECDIS is also used for programming AIS information to be sent out via the AIS instrument. On the ECDIS display, any port information from the Fairplay database can be shown. Tide and current can be read from tide and current modules.

MARIS ECDIS
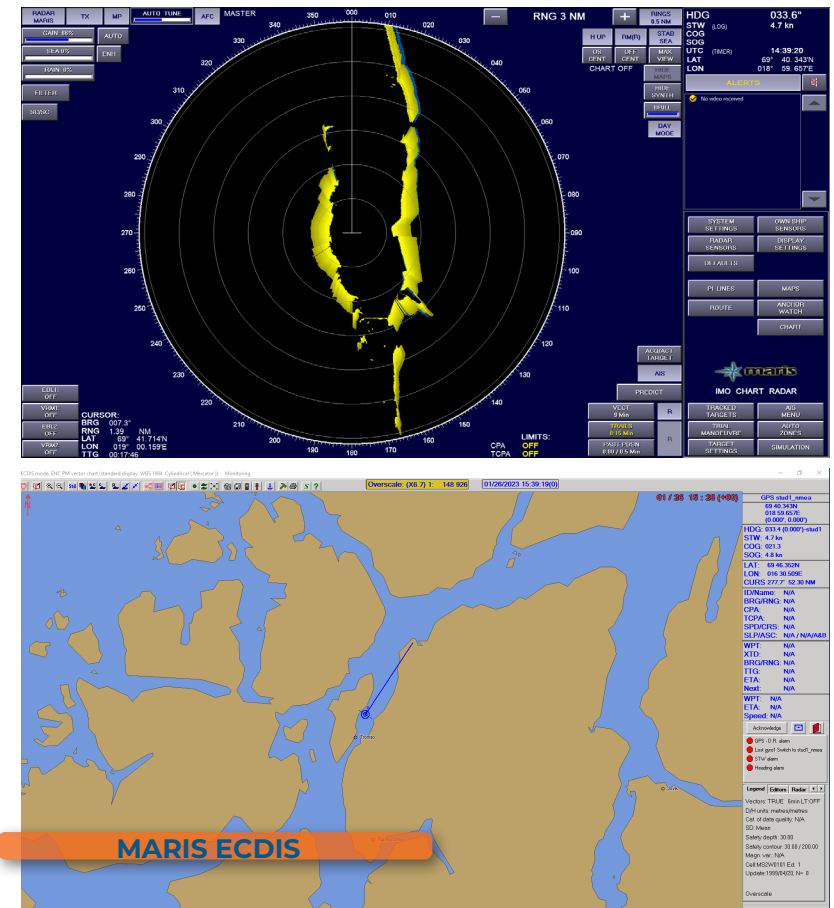
3 Relevant Hardware

3.1 Small components

Using hardware can provide a more realistic experience. We can provide the following components:

- Steering wheel
- Engine control lever
- Thruster control level
- Radar Control Panel
- Gyro compass repeater
- Panel with joystick, horn and autopilot

Optional hardware for expanded training purposes include:

- Auto Pilot
- Hardware Radar/ARPA
- VHF DSC
- Lighting control panel
- Fire Alarm Panel

3.2 Consoles

Poseidon can build a bridge construction that will resemble a conventional bridge that can be used for several types of Own Ship models. The bridge will contain ship consoles with instruments and the visualization module. All local work with regards to building, projection walls and electricity is the responsibility of the customer. Plans for the building must be supplied for Poseidon to make accurate drawings of the simulator set-up.

The instructor will need a table for the PC-monitors and keyboard and communication equipment, as well as some space for maps and technical books. Repeater monitors of the bridge visuals and radars (not required) is very useful for the instructor for monitoring the different bridges. This can be installed on shelves in order to get a good overview.

Instructor Station

3.3 Ship Bridge Consoles

Equipment and monitors can be installed in ship consoles. The color and finish can be chosed by the customer.
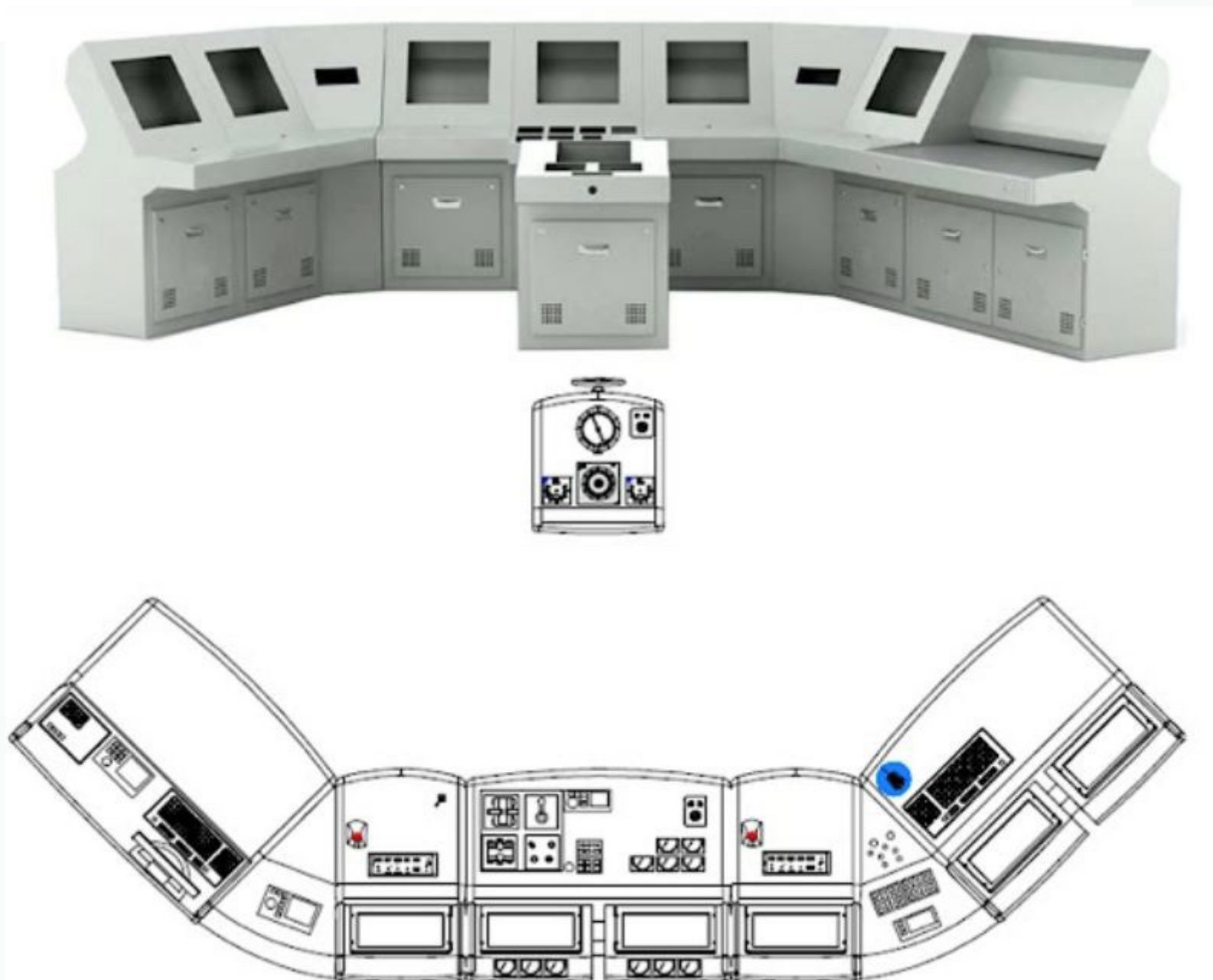
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