

POSEIDON SIMULATION AS



BOREALIS

Navigation Simulator



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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 our 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 it is important to us that our products are adaptable to the needs of every customer, and we are always making sure our solutions are consistent and reliable.

1 INSTRUCTOR STATION

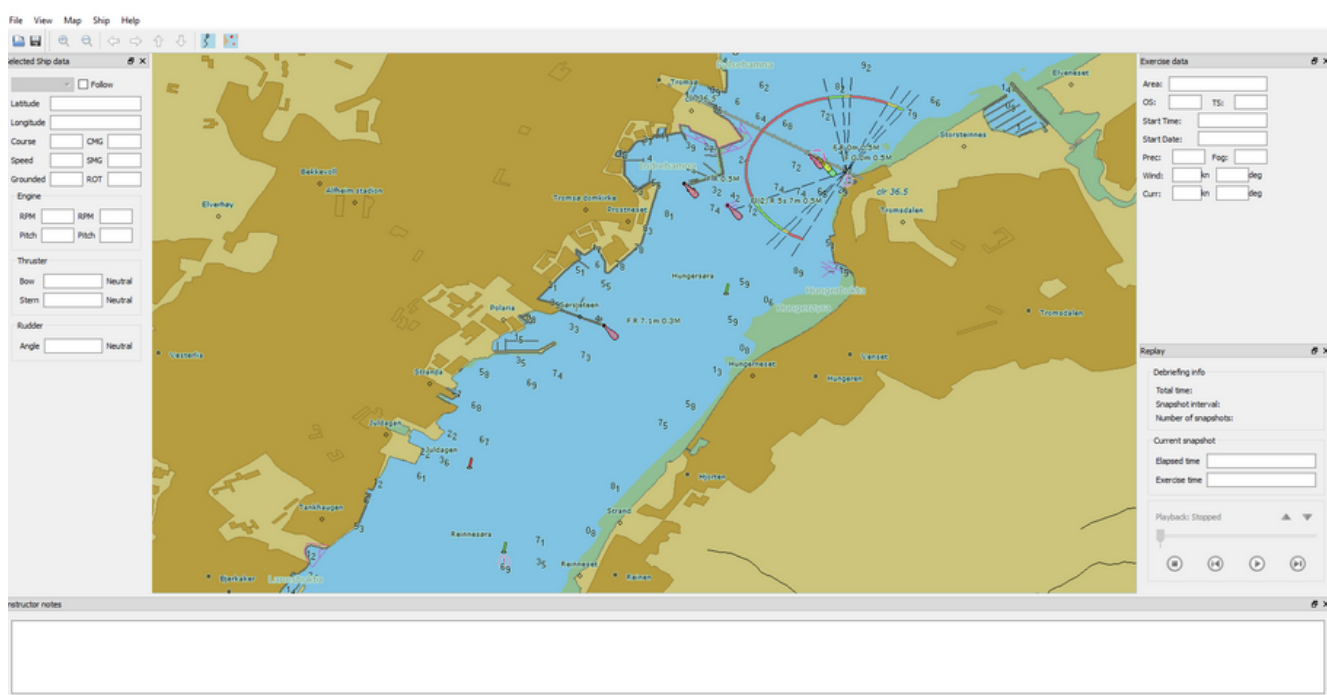
1.1 Exercise Manager

The Poseidon Exercise Manager (PEM) is the core software module of the Borealis Bridge Simulator. It acts as both the network server and the instructor's main interface for preparing, managing, and conducting training exercises. PEM runs on the Windows operating system and is optimized for standard COTS PCs, requiring no specialized hardware.

Exercises are prepared directly in the ECDIS-based chart interface. Instructors can insert and configure ships, buoys, racons, SARTs, environmental conditions, tides, and vessel traffic models. All elements may be adjusted at any time during preparation, and scenarios can be saved, reused, or exported as situation reports.

Key functions include:

- Inserting own ships, target ships, buoys, racons, SARTs, and other exercise objects
- Editing ship parameters (course, speed, light settings, signals)
- Setting weather, visibility, tide, and current conditions
- Adjusting general exercise parameters and comments
- Saving exercises for future use
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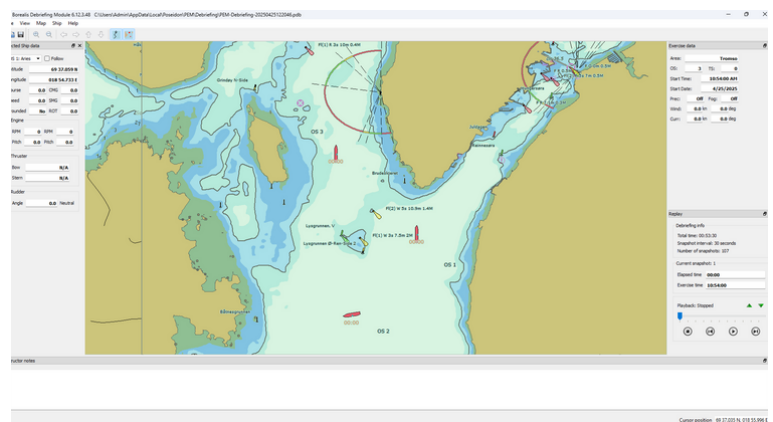
1.2 Running and Monitoring Exercises

During an exercise, PEM provides full operational control. The instructor can monitor vessel positions, ship data, and student activity across all connected stations. Radar and visual displays from each student station can be viewed from the instructor station.

Environmental conditions can be changed during an active exercise, grounded own ships can be moved to safe waters, and new target ships can be inserted as needed. Exercises may be paused, stopped, or saved as new scenarios at any stage.

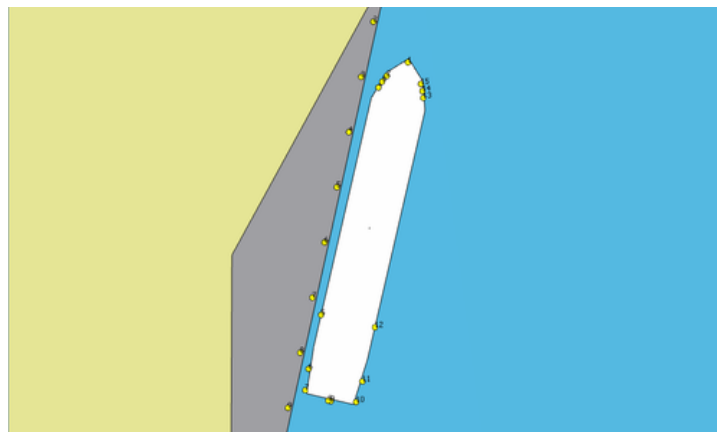
1.3 Briefing and Debriefing

A dedicated briefing/debriefing module supports both pre-exercise preparation and post-exercise review. The instructor may present the planned scenario before starting the session and replay the completed exercise afterward to show ship movements, decisions, and key events. This provides a structured foundation for discussion, feedback, and evaluation.



1.4 Maneuvering Manager (Optional)

The Poseidon Maneuvering Manager (PMM) is an optional software module for supervising mooring and anchoring operations. The module provides a bird's-eye view of ships, piers, bollards, and mooring lines, allowing the instructor to observe loads on mooring lines and anchor chains. Excessive tension will cause lines to break, enabling realistic training in berthing and anchoring procedures.





2 DATABASE AND ELEMENTS

2.1 Ships and sailing areas

The Borealis simulator includes a comprehensive database of ship models and predefined sailing areas. Any own ship may also be used as a target ship, and an unlimited number of target vessels can be inserted into an exercise. Hydrodynamic modelling is based on SSPA research, providing realistic ship response across a range of vessel types.

Sailing areas are based on accurate navigational charts and include ports, cultural objects, navigational marks, and coastal features. Custom ship models and custom sailing areas can be supplied on request.

2.2 Elements

A wide range of additional elements can be included in any scenario:

- Navigational marks, buoys, lighthouses, and lightships
- Racons and SARTs
- Rafts, persons in water, and other obstructions
- Berths, fenders, piles, and mooring points
- Environmental conditions such as fog, haze, rain, sea state, tides, and currents

All elements integrate consistently across the chart view, radar/ARPA simulation, and visual system.



3 COMPLIANCE

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 receive 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 - Respond to a distress signal at sea
- A-II/5.2 - Contribute to berthing, anchoring and other mooring operations

3.1 IMO Model Courses

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





4 STUDENT STATION

4.1 Poseion Virtual Console

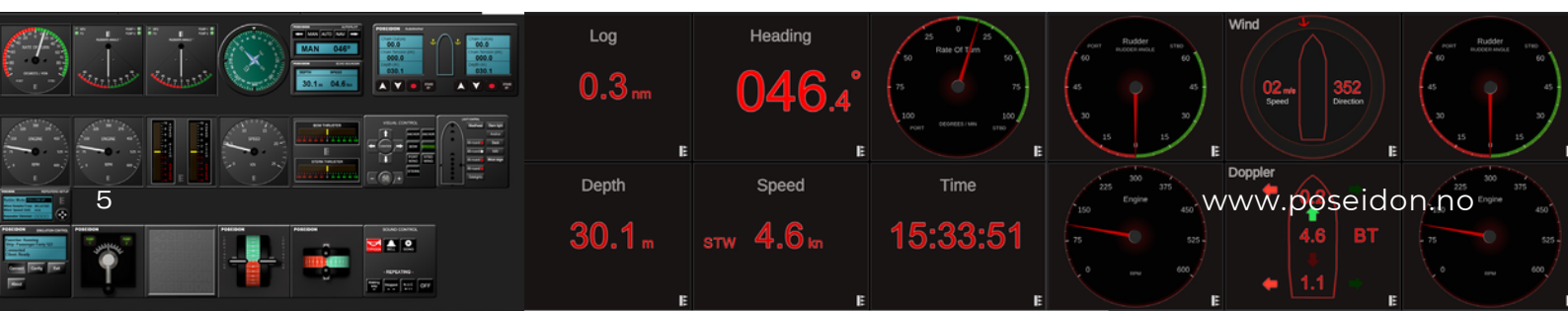
The Poseidon Virtual Console (PVC) simulates the ship's bridge instruments and control panels used by students during an exercise. All analogue and digital instruments are generated in software and are linked to the hydrodynamic ship model selected in the scenario, ensuring that each instrument reflects the vessel's actual behaviour.

PVC includes the full range of navigation and control instruments normally found on a modern bridge. These can be operated directly on-screen, and their values are continuously updated as the ship maneuvers.

Instruments and indicators available include:

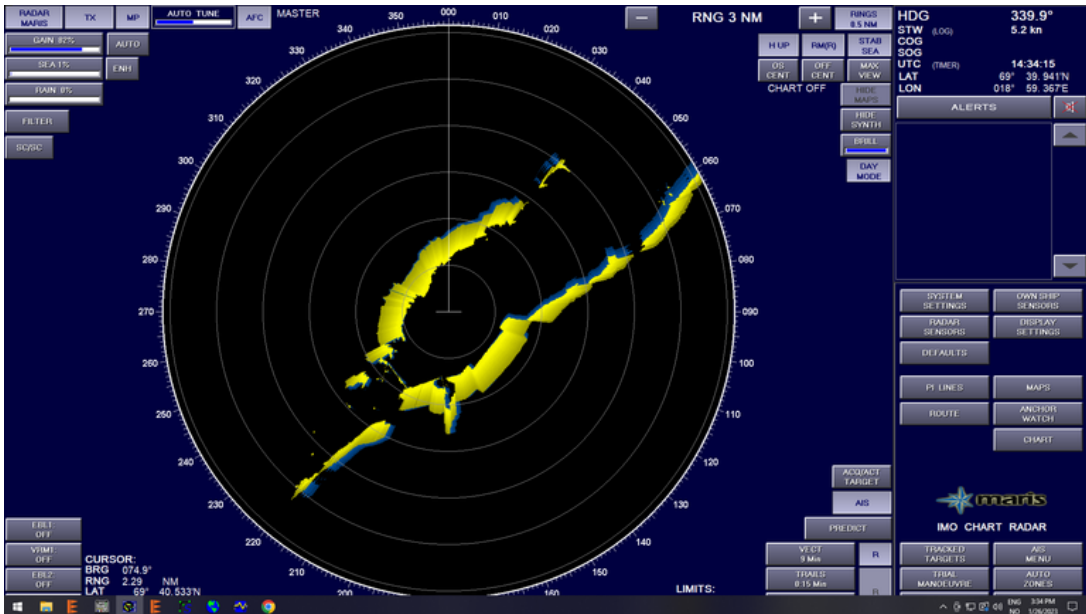
- Rudder control and rudder angle indicators
- Propulsion controls (engine telegraph, tachometer, propeller pitch)
- Bow and stern thruster controls and repeaters
- Autopilot control panel
- Ship speed, log, and ROT display
- Magnetic, gyro, and satellite compass
- GPS, Loran-C, and RDF
- Echo sounder
- Wind instruments
- Day and night light controls
- Sound signal controls
- AIS display and status information
- General navigation and system indicators

All instruments follow the conventions and behaviour of their real-world counterparts. PVC can be configured to match different ship types, making it suitable for a wide range of training scenarios.



4.2 RADAR / ARPA Simulator

The Poseidon Radar/ARPA Simulator (PRS) provides a full simulation of X-band and S-band radar systems in accordance with STCW requirements. PRS includes all radar and ARPA functions needed for training in observation, plotting, target tracking, and collision avoidance. The radar can be operated entirely on-screen using a standard 3-button trackball or mouse.



ARPA functions include:

- Manual and automatic target plotting
- Guard zones and exclusion zones
- Target vector modes and history trails
- CPA/TCPA alarms and limits
- Trial manoeuvre functions
- Fixed target suppression and interference control
- Racon and SART detection

Radar functions include:

- Gain, sea clutter, rain clutter, tuning and performance monitor
- Range scales, range rings, heading line and offset
- Relative and true motion modes
- North-up, head-up, and course-up presentations
- Electronic Bearing Line (EBL) and Variable Range Marker (VRM)
- Parallel indexing and echo controls
- Day/night illumination and CRT-style adjustment controls

PRS can be configured as either X- or S-band and supports the use of two radars on full-mission bridge setups.

4.3 ECDIS

The Borealis simulator supports integration with MARIS ECDIS900 for realistic route planning and monitoring. MARIS was among the first PC-based ECDIS systems to receive IMO approval and complies with IMO Resolution A.817 performance standards.

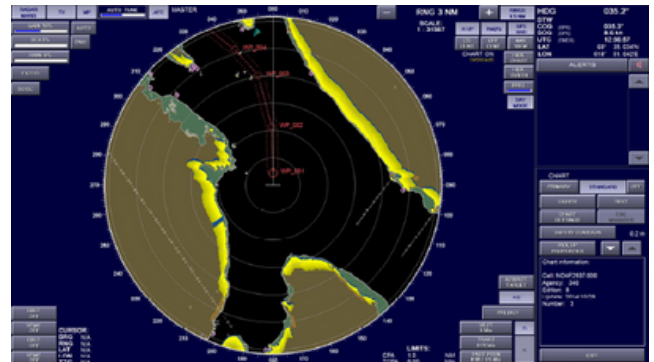
Chart database compatibility:

- IHO S-57 v3.0
- C-MAP CM-93
- ARCS and NOAA charts
- Official ENC (including Primar)



Navigation planning features:

- Creation, modification, and deletion of routes
- Up to ~200 waypoints per route
- Grounding and danger-area alarms
- Safety contour configuration and prohibited-area warnings
- Route calculations and voyage planning tools



Route monitoring features:

- Safety contour crossing alerts
- Deviation from route and waypoint arrival alarms
- AIS target display and monitoring
- Integration with tide and current modules
- Display of relevant port information where available



All ECDIS functions operate in coordination with the simulator's ship model, radar, and visual system to maintain consistent navigation data. The MARIS ECDIS900 logs position, time, course, heading, and speed throughout the route via the AIS interface, and incoming AIS messages are shown directly on the display with all available ship information. The system can also be used to programme AIS data for transmission, display port information from the Fairplay database, and access integrated tide and current modules where available.

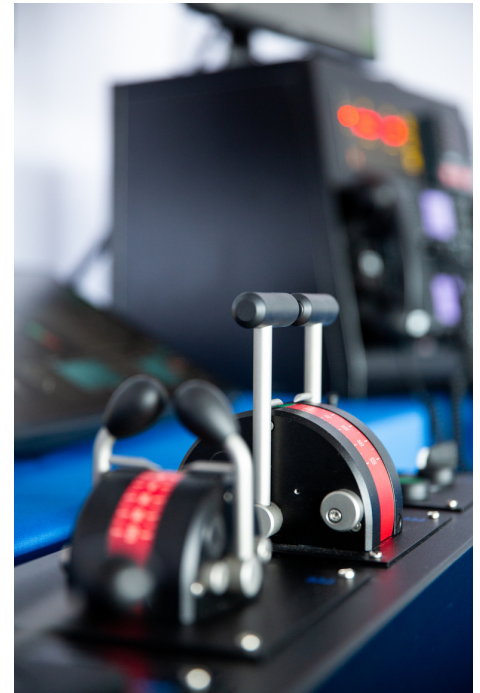
5 CONSOLES AND HARDWARE OPTIONS

5.1 Components and Controls

To enhance realism, the Borealis simulator supports a wide range of physical controls and instruments. These components replicate the look and feel of shipboard equipment and can be integrated into any simulator configuration.

Standard hardware options:

- Steering wheel
- Engine control lever
- Thruster control lever
- Radar control panel
- Gyro compass repeater
- Joystick and horn panel
- Autopilot panel



5.2 Bridge Consoles

Poseidon offers custom-built bridge console solutions that replicate the layout and functionality of a conventional ship bridge. Consoles can be configured for different ship models and equipped with the required instruments, displays, and visual systems.

Each installation is tailored to the needs of the institution—whether a compact desktop arrangement, a portable training station, or a full-mission bridge with projection visuals. Solutions are designed to match the available space, curriculum, and training level, from vocational programs to universities and advanced maritime academies.



5.2 The portable Console

For training environments where space is limited or flexibility is important, Poseidon offers a portable console solution. The unit provides hands-on operation with real navigation controls while remaining easy to move, set up, and store.

A portable console allows classrooms and training areas to be reconfigured quickly without sacrificing the realism of physical instrumentation. It is ideal for multipurpose rooms, mobile training setups, or institutions needing adaptable simulation facilities.





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6 EXAMPLE INSTALLATIONS



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