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MARITIME INFORMATION SYSTEMS AS

MARIS ECDIS900

ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM

DNV

0575/06
Wheelmark Approved

a Grieg Group Company

MARIS ECDIS900 has been developed based on extensive experience of a world-class innovative engineering team with several “world firsts” in maritime electronics within radar data processing, radar data extraction, display presentation and electronic cartography.

MARIS ECDIS900 was the first ECDIS in the world to receive a type approval certificate (“Wheelmark”) using a Flat Panel Computer (FPC) and is fully compliant with the IMO Resolution A.817(19):1995, IMO Resolution MSC.64(67), Annex5:1996, IHO S-57 and S-52 Standards, IEC 61174:1998 and IMO A.817(19) Appendix A.7:1998.

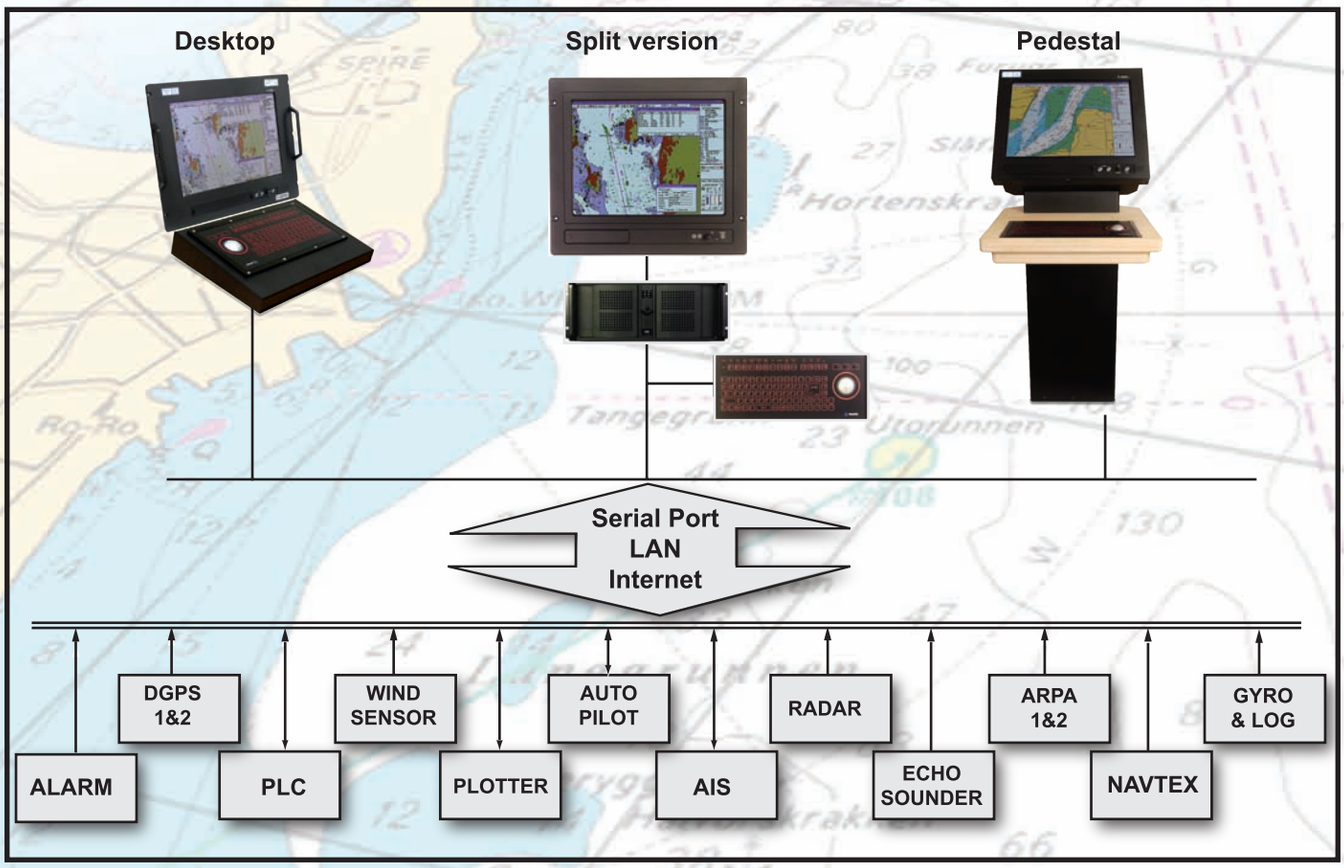
The MARIS SmartLine is the only Flat Panel Computer certified to IEC 60945 for use on board ships.

The MARIS ECDIS900 is an extremely powerful navigation and information display system enabling radar video overlay and complete ARPA functionality.

This combined with display of AIS data provides the professional mariner with the complete navigational situation on one display eliminating the need to reference and appraise information from multiple sources - charts, navigational sensors, radar, ARPA, etc.

Key Benefits of MARIS ECDIS900:

- Total navigation situation appraisal on one integrated display, chart, radar, ARPA and AIS eliminating the need to move between instruments and designed in accordance with IMO/IEC requirements for Integrated Navigation Systems
- Wheelmark (EU) Approved.
- Powerful decision support and information tool.
- Capable of incorporating official HO ENC’s along with raster charts produced by several official Hydrographic offices.
- Enables extremely precise navigation providing precise bearings to lights and landmarks at long ranges.
- Greatly reduces workload in the production of Voyage Plans, ETA’s and rapid changes to these.
- Operates with all major chart formats and provides seamless presentation of ARCS ENC charts.
- The first ECDIS with simple, low cost, update and maintenance of charts via E-Mail through MARIS server.
- Interfaces to a large variety of navigation sensors.
- Selection of hardware options enabling ease and flexibility of installation on new buildings and sailing ships.
- Fuel saving.
- User-friendly man machine operation with “built inn” user-manual and online help.
- Norwegian Maritime Directorate approved and certifiable ECDIS computer based training (CBT) module.
- High mean time between failure and low mean time to repair.
- Low cost of ownership.



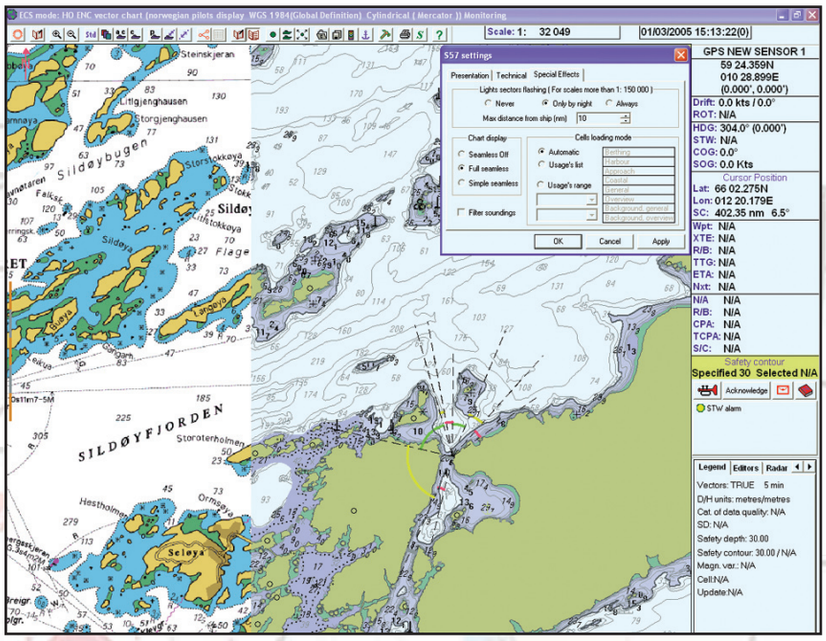
MARIS ECDIS900 operates with multifuelled ENC (S57) and raster charts in the following formats:

Raster Charts.

- ARCS - British Admiralty raster charts
- NDI/BSB - raster charts by the Hydrographical offices of USA and Canada.
- NOS/GEO
- Seafarer - charts produced by the Australian Hydrographic Office.

Vector Charts

- ENC (S57)
- Primar ENC (S57)
- IC-ENC (S57)
- JHA- ENC (S57)
- NOAA-ENC (S57)
- AHO-ENC (S57)
- DNC - published by NIMA (USA)
- Compatible with C-MAP world wide database

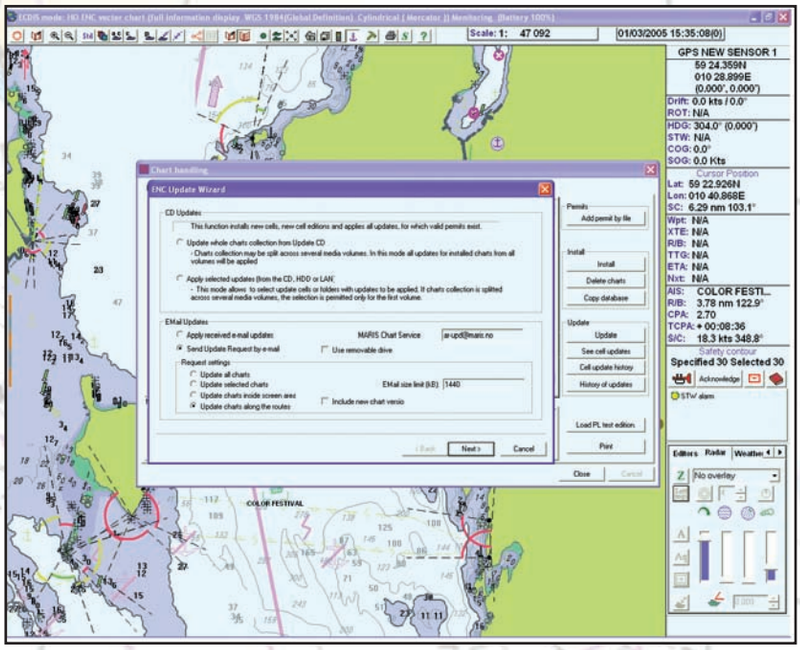


MARIS ECDIS900 may display simultaneously an unlimited number of charts in ARCS ENC-format with seamless transition presentation.

Chart Updates / Corrections

The MARIS chart update - correction service provides:

- Instant update on board of ARCS, ENC charts with the MARIS ECDIS900 integrated and optimised update service via email.
- Easy access and handling: installs charts along a selected route, instantly switches between different chart databases.
- Integrated help for paper chart corrections - updates using ARCS service and enabling colour print out of the latest updated chart tiles in actual scale. Tiles may then be pasted to paper charts.
- CD's are provided every three months with complete updated chart collection.



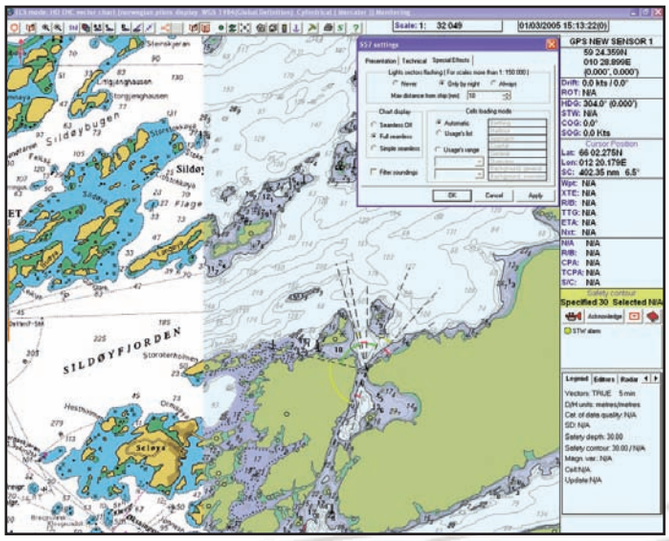
MARIS ECDIS900 e-mail up-date «wizard» enables simple chart update.

Chart Display Options

Simultaneous seamless display of ARCS and ENC charts to scale in transition between areas of chart coverage.
User defined tool bar and menu configurations with day and night settings. Instant range zoom in or out.

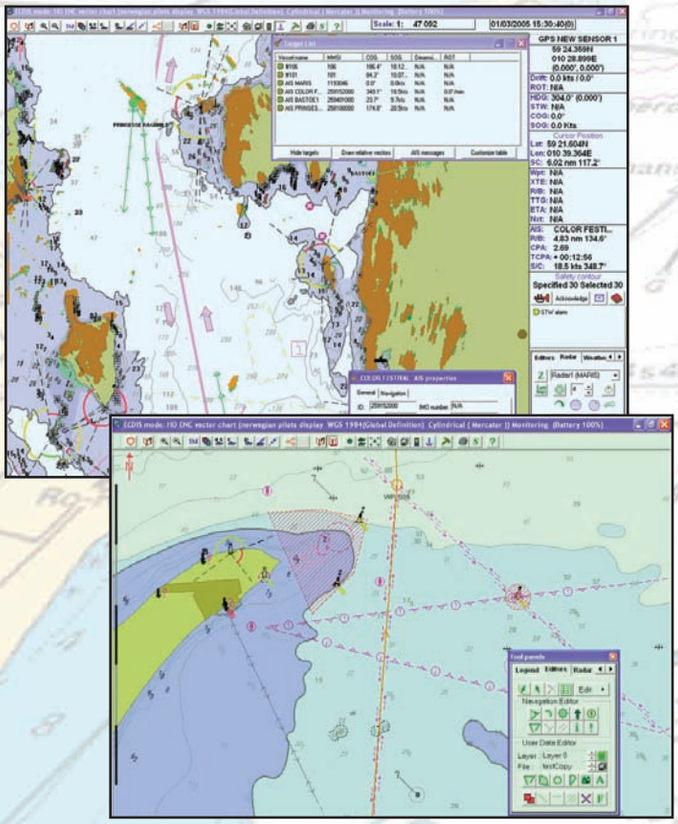
Displayed chart orientation may show any combination of the following modes:

- Head-Up/North-Up/Course-up.
- True Motion / Relative Motion.



Accurate Realtime Positioning

MARIS ECDIS900 provides the professional navigator with a total navigation situation appraisal and vital voyage information including:



Primary and Secondary Ship Position

- Raw Radar overlay.
- ARPA Target Information.
- AIS target information with call sign display.
- Navtex information.
- Data from interfaced sensors - gyro, log, GPS, Echo sounder ,anemometer, etc.
- Vessel Track.
- Weather data.
- Display of the ship's contours in the chart scales comparable with the ships dimensions.
- Information relating to dangerous objects on charts.
- Colour bearing light sector displays.

AIS

- MARIS ECDIS900 includes as standard an advanced interface to operate any AIS transponder system without additional AIS keyboard and display (AIS man machine interface replicated in MARIS ECDIS900).
- AIS targets are displayed together with ARPA targets and the AIS targets CPA/TCPA are calculated and all AIS events recorded in the system logbook.
- Easy and efficient handling of incoming/outgoing AIS messages from the MARIS ECDIS900 - no need to move between ECDIS and AIS receiver.
- In one click a standard message may be selected and broadcast from the MARIS ECDIS900.

Object Editor for User Information

- Add personnel annotations. Work on electronic charts as on paper charts with powerful graphical tools; bearing lines, range circles, parallel and perpendicular lines.
- Store navigation survey work in the logbook.
- Add marks, lines zones.
- Create user object alarms: crossing a line, entering or moving out of an area and anchor alarms.
- Import chart and user files with or without datum corrections.

Route Planning

- Mix great circle and rhumb line legs, enter different turning radius values and select different XTE limits for each leg.
- Route creation either by latitude / longitude co-ordinates, cursor, import or download from dGPS.
- Multi route management. Display several routes. Create routes by selecting waypoint from any display route. Link or split routes, continue waypoint editing from any point.
- Check the route for dangers and highlight them on the chart.
- Route simulation: passage plan calculator including ETA/TTG and required speed.
- Check safety along the route in real time.
- Continous display of heading, speed, depth and position.
- Select ETA and monitor speed required.
- Autopilot and track pilot control.

Passage Plan

- Prepare, store and print a passage plan linked to the selected route.
- Passage plans, compliant in particular with Tanker regulations are partially filled in by the MARIS ECDIS900 (Chart numbers and waypoint positions, and then completed by the navigator manually).

Navigation Data Log and Play Back

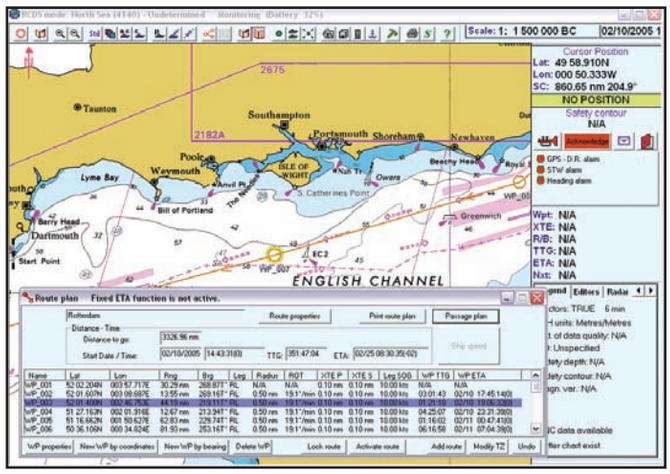
- Genuine Navigation Data Recorder: stores all navigation events including own ship, AIS and ARPA target positions, speed and course, alarms triggered and acknowledged, chart in use, manual position plotting, manual bearings and events.
- All data is written to a new and secure read only file every 24 hours.
- All stored files may be replayed at any time using the same ECDIS software and comparable with IEC 61996 Annex D.
- Simplified Voyage Data Requirements.

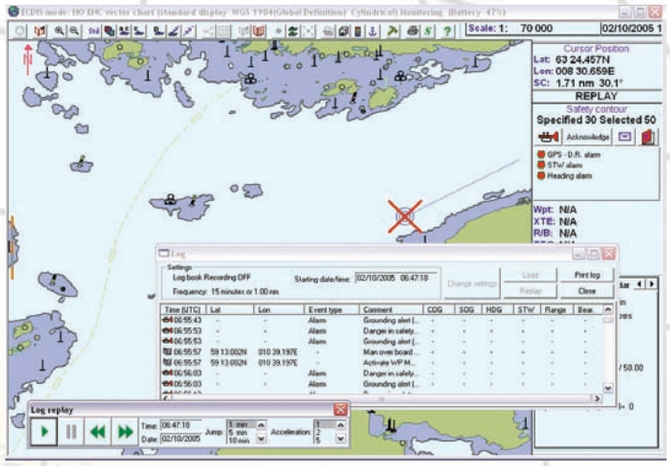
Alarms

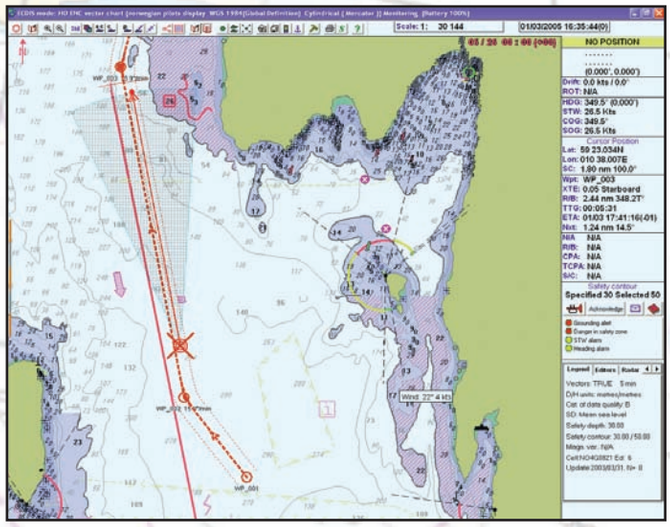
The following alarm groups are built into the MARIS ECDIS900:

- Anti-grounding alert.
- Approach of critical points.
- Radar ARPA /AIS targets (CPA/TCPA).
- Approach of critical points.
- Sensor failures, GPS, etc.
- XTE out of limits.
- User defined alarms.
- User defined anchor alarm.

Route Monitoring

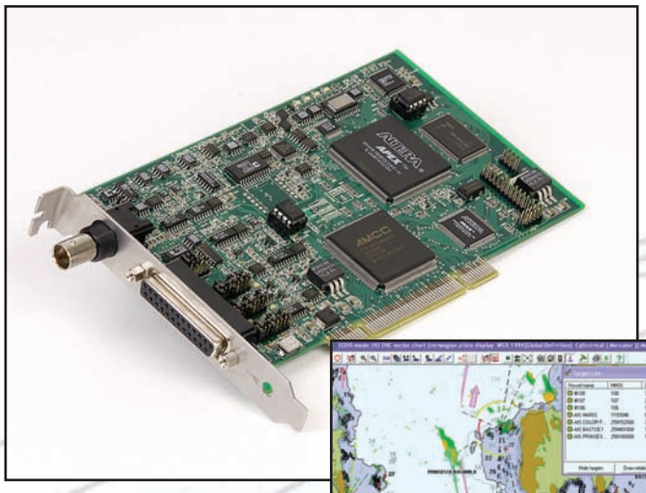


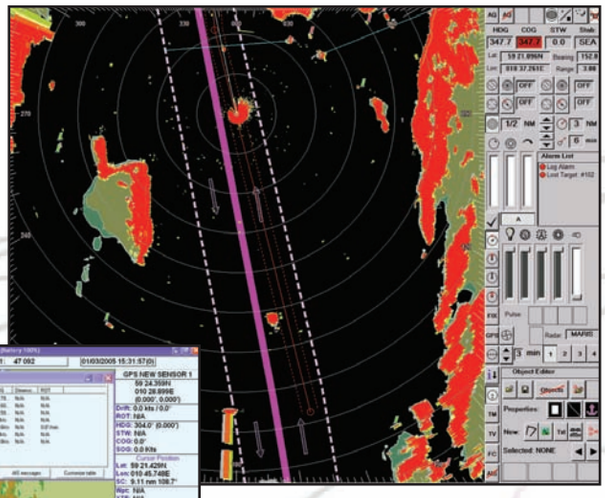


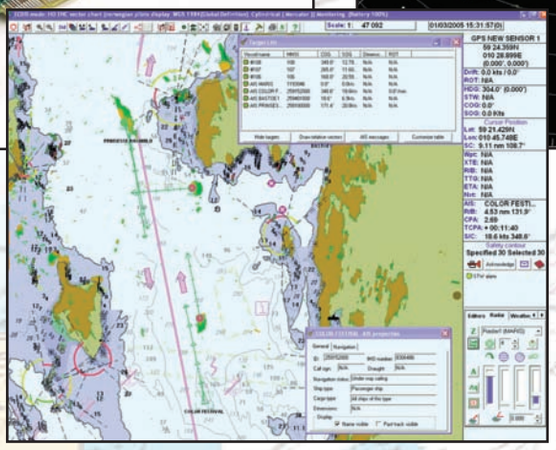


ARPA2000 With MARIS PC Radar Kit

- Raw radar video can be displayed on top of the electronic chart.
- Advanced image processing and numerous video control functions are available to give clear and precise radar picture presentation under all weather conditions.
- Advanced radar ARPA presentation with scan-to-scan correlation.
- An unlimited number of ARPA targets can be displayed on the ECDIS.
- Displays the route made active in ECDIS presentation and can use the same background charts as the ECDIS.



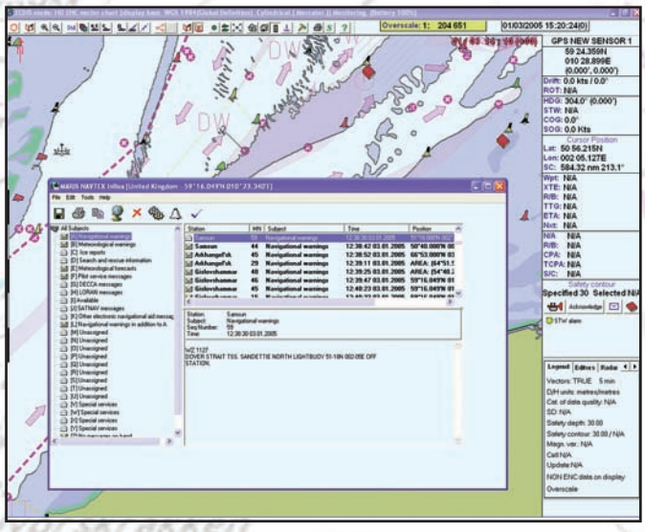




Integrated NAVTEX Information

MARIS ECDIS900 provides the professional mariner with a NAVTEX management facility providing:

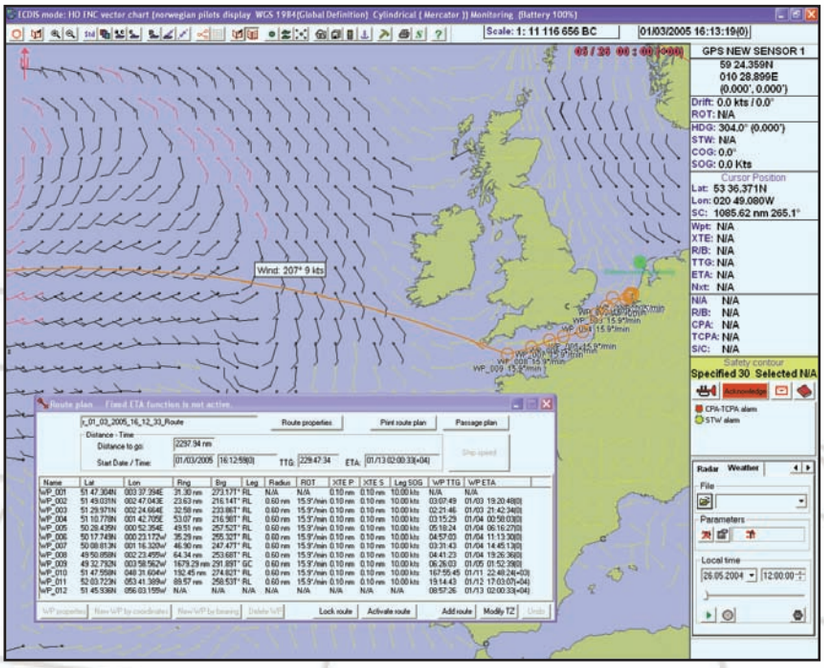
- Automatic reading and processing of messages arriving via NAVTEX.
- Automatic extraction of coordinates, area, transmitting station, topic and other parameters and plotting of data on the ECDIS900 chart display.
- Generation of automatic alarms on entry into an area with warnings broadcast by NAVTEX, or at the approach to a single message mark.
- Recording of NAVTEX messages in the logbook with the message mark displayed on the electronic chart.

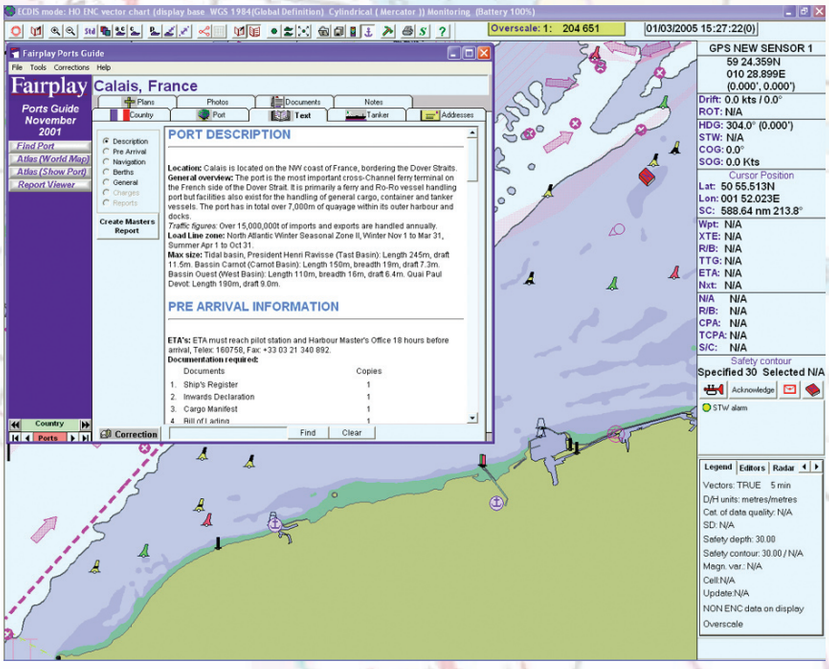


Weather Forecasts

MARIS ECDIS900 weather module displays different weather layers including wind force and direction, pressure, swell, waves, typhoon history and forecasts and temperature. Weather forecasts may cover several days depending on the source of the data.

- MARIS ECDIS 900 weather module supports its own internal format, GRIB data format and can import weather files from global meteorological offices.
  - Monitored parameters include:
  - Pressure.
  - Wind peed and direction.
  - Significant wave heights.
  - Swell (height, period, direction).





Fairplay Ports & Terminal Guide

- Full details of all ports and terminals plus maritime atlas and distance tables. Contains all of the information you need to plan your next port of call.

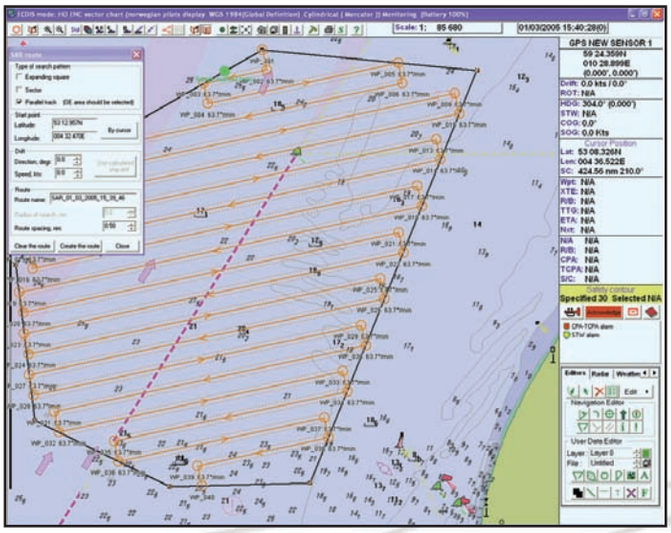
- Comprehensive details are provided on over 8,336 ports and terminals including a complete description of the port and the relevant facilities, plans and mooring diagrams (over 4,000 in total), contact details of port service providers and agents, maritime atlas, port photographs and world wide distance table.

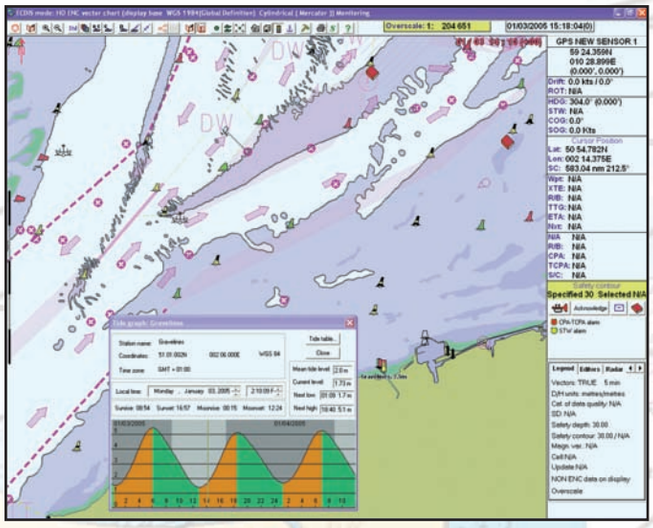
Search and Rescue

MARIS ECDIS900 enables search and rescue patterns / routes to be created in accordance with SAR search schemes recommended by the international SAR convention:

- Expanding square.
- Parallel Track / Creeping line.
- Sector Search.
- Internet connection to read national or international AIS network.

SAR patterns are corrected for current and drift.





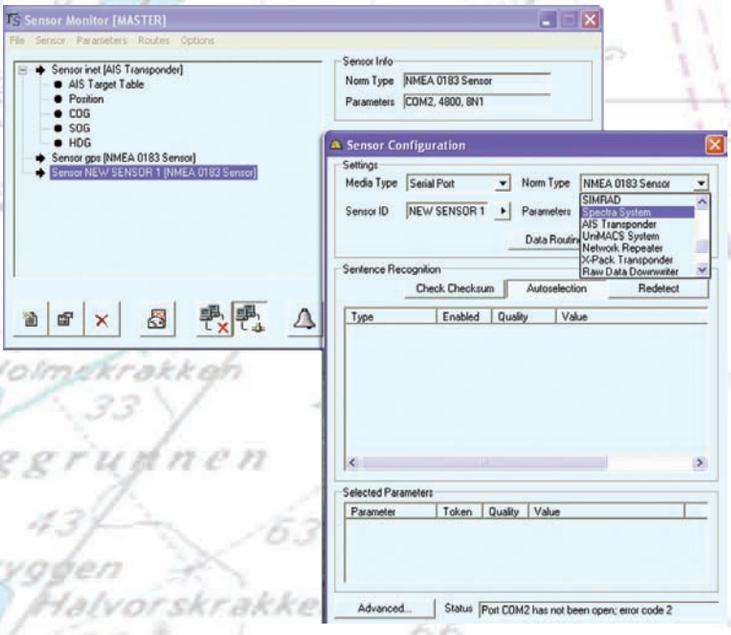
Tide and Current

Tide and current predictions are available for thousands of main tide stations Worldwide.

- Local tide regions.
- Real time calculations for specific areas.
- Seasonal ocean current as on Pilot Charts.
- Moon rise and set hours.

Sensor Monitor and internet connection

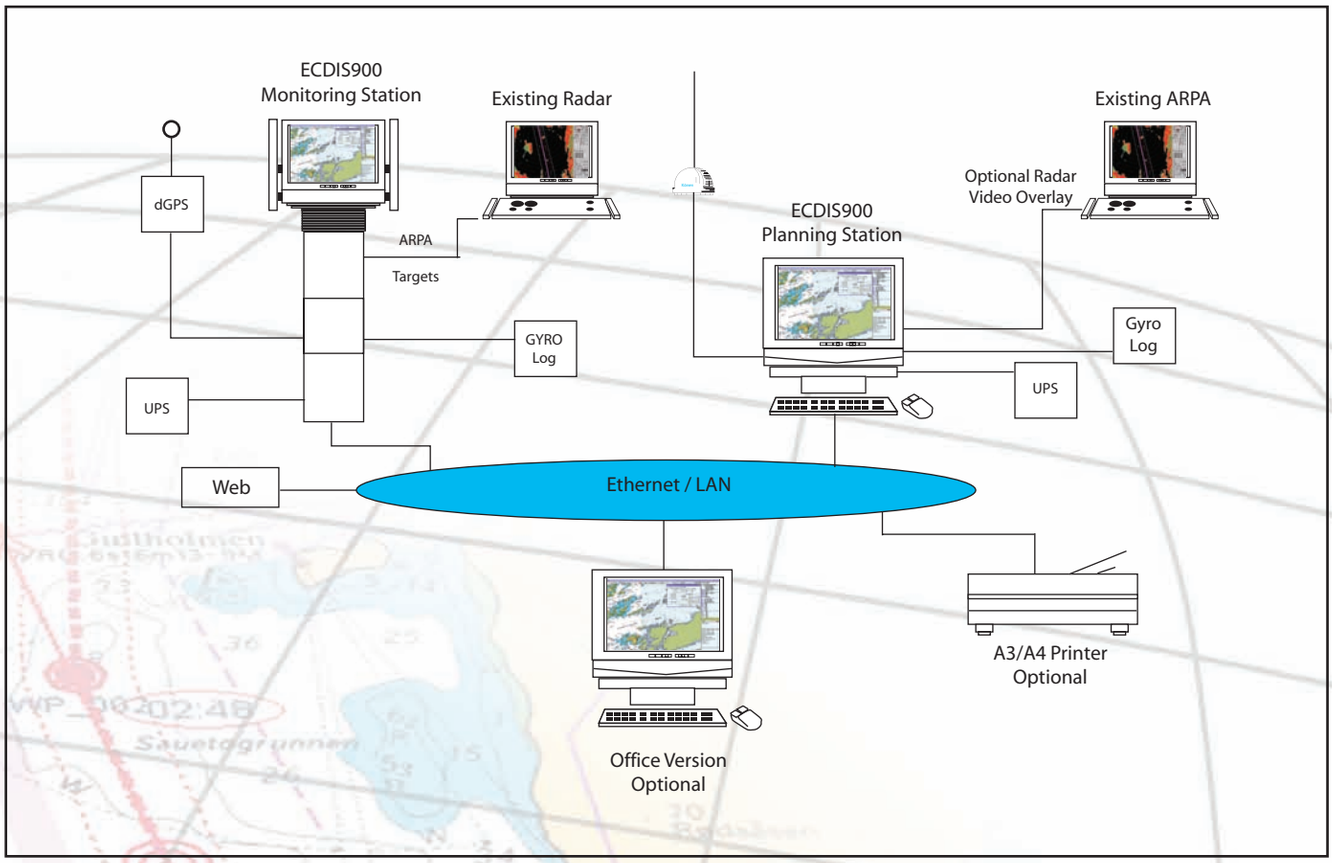
- Flexible software tool named Sensor Monitor to link system to external sensors or data via serial port, network, Internet and file trasfer.
- Serial or TCP/IP interface with GPS, Gyro, ARPA radar, Log, Anemometer, Echo Sounder, etc.
- Download or Upload routes from / to GPS or Radar.
- Download AIS targets through national AIS network.
- Advanced data logger for trouble shooting.



Network and Data Sharing.

Numerous MARIS ECDIS900 workstations may be networked and data shared between them providing:

- All data input, including radar video, can be broadcast over a network allowing several MARIS ECDIS900's to access the same data.
- Dual ECDIS system: network based applications ECDIS master and ECDIS back-up share the same data (sensor data input, Alarms, Active Route and Way point, etc).
- ARPA2000 may be installed in captain's cabin displaying the traffic and enabling remote operation of the ARPA software (Optional PC RADAR Kit).
- MARIS ECDIS900 may be installed in engine control room to display chart, own ship and surrounding traffic situation.
- ECDIS data may be extracted and broadcast to Passenger Information Systems onboard.

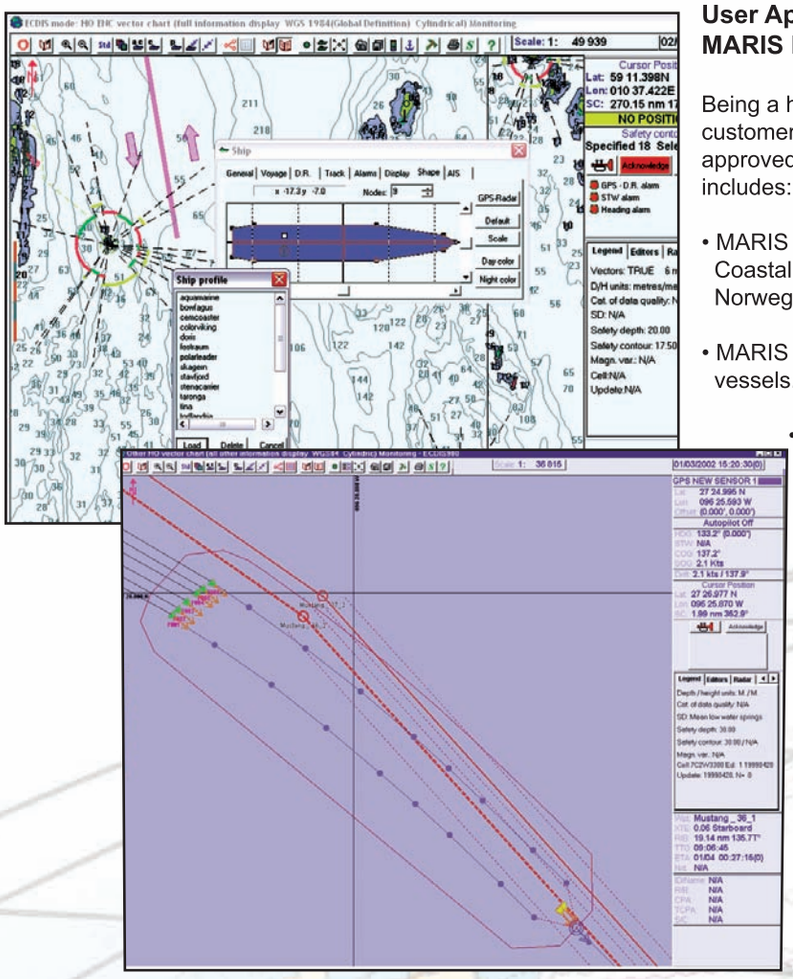


Maritime Digital Services

MARIS has distributor rights of the most significant chart and data providers worldwide.

* E-Mail update of electronic charts from PRIMAR (ENC) and Admirality ECDIS Service (ENC + ARCS).
* Buy or rent chart data for shorter or longer periods.
* Simplified ordering and distribution

THE UNITED KINGDOM HYDROGRAPHIC OFFICE
Japan Hydrographic Association
PRIMAR STAVANGER
Canadian Hydrographic Service
ADMIRALTY CHARTS AND PUBLICATIONS
NOAA
MPA SINGAPORE
C-MAP NORWAY THE ELECTRONIC CHART STANDARD
MAPTECH
ic-enc



User Application Specific Configurations of MARIS ECDIS900

Being a highly flexible system design house MARIS offers customer specific applications built upon its standard type approved MARIS ECDIS900 hardware and software that includes:

- MARIS ECDIS900 Pilot Mate-NP adjusted to Norwegian Coastal Administration specifications for chart systems to Norwegian Pilots.
- MARIS ECDIS900 Seismic Module for seismic survey vessels.
- MARIS ECDIS900 Dredging Module for dredging operations.
- ECDIS900 Inland waterways module for inland ECDIS applications.
- Mini-ECDIS900 for small craft applications
- WECDIS900 according to standards for military applications.
- ECDIS900 Voyage Planner developed as a tool to create documents as required in SOLAS regulations.

Other application modules may be rapidly developed in accordance with customer specific requirements.

Dedicated hardware in compliance with CE, Wheelmark and IEC 60945. The MARIS hardware is highly flexible allowing ease of installation on all types of vessels.

The hardware range includes the SmartLine™ Flat Panel Computer incorporating 20.1" or 23.1" TFT monitors that may be mounted on a variety of pedestals or console mounted.

Alternatively a separate console or pedestal mounted 20.1" or 23.1" TFT display with separate PC is available. All configurations offer an integrated backlit keyboard with roller ball, which may be integrated in desktop, console or pedestal configurations.

Operator Training

In collaboration with Norway's leading supplier of maritime computer based training, Seagull A.S, MARIS offers its customers on board CBT based operator training courses with the focus on the safe operation of MARIS ECDIS900, proper uses of various types of ECDIS related information and knowledge of the capability and limitations of electronic chart systems.

The course as designated takes into account the International Conference on STCW (Standard of Training, Certification and Watch Keeping 1978 and 1995), which define required training, ref. STCW95,Chapter II, Section A-II/I and Table A-II/1

The course is approved by the Norwegian Maritime Directorate and on successful completion a Certificate of Competence (as per STCW'95 Chapter II-Reg II/I, II/2, II/3) is issued.

Alternatively the same MARIS ECDIS900 training courses may be arranged in MARIS facilities in Norway, or at the customer.

A selection of our references

Billabong AS
Blue Star Line
Royal Arctic Line A/S
Torvald Klaveness Group
Shell Tankers Ltd
James Fisher & Sons Ltd
British Petroleum Tanker Company.
Bergesen d.y ASA
J. Lauritzen
Leif Høegh & Co
SeaTrans Group
Wilhelmsen Lines
Kristian Gerhard Jebsen Skipsrederi AS
Stena Line AB
Stolt Nielsen
Royal Wagenborg
Novoship

Technical Service and Support

MARIS maintains a well-established worldwide network of authorised service stations, which are coordinated by the Customer Support Center in the company's head office in Tønsberg Norway.

MARIS provides 24 hours 7 days a week professional support to its customers irrespective of their location.

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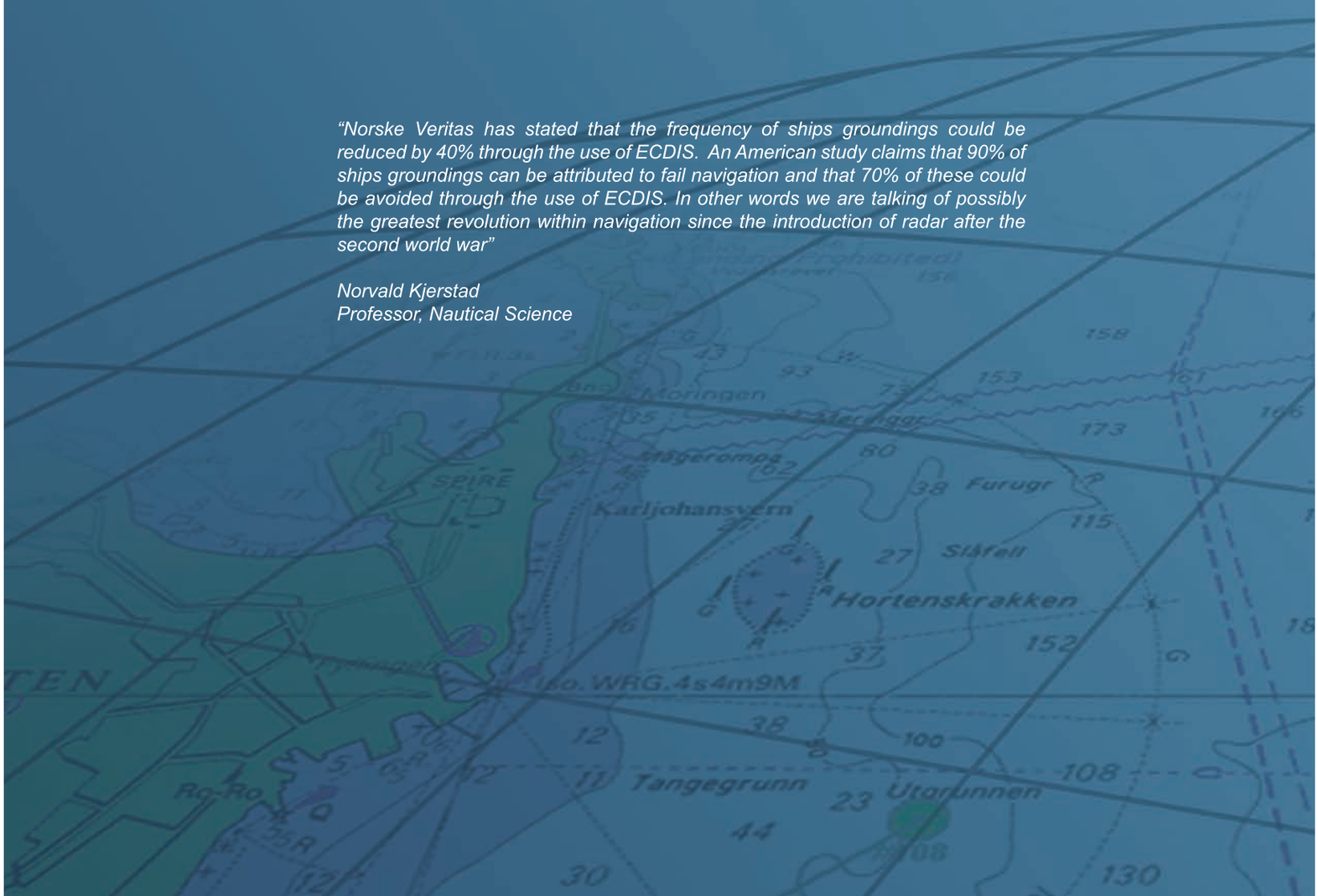
"Norske Veritas has stated that the frequency of ships groundings could be reduced by 40% through the use of ECDIS. An American study claims that 90% of ships groundings can be attributed to fail navigation and that 70% of these could be avoided through the use of ECDIS. In other words we are talking of possibly the greatest revolution within navigation since the introduction of radar after the second world war"

Norvald Kjerstad
Professor, Nautical Science



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