

MODEL COURSE 1.27

OPERATIONAL USE OF ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEMS (ECDIS)

2012 Edition

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Since its inception the International Maritime Organization (IMO) has recognized the importance of human resources to the development of the maritime industry and has given the highest priority to assisting developing countries in enhancing their maritime training capabilities through the provision or improvement of maritime training facilities at national and regional levels. IMO has also responded to the needs of developing countries for postgraduate training for senior personnel in administrations, ports, shipping companies and maritime training institutes by establishing the world Maritime University in Malmö, Sweden, in 1983.

Following the adoption of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 (STCW), a number of IMO Member Governments had suggested that IMO should develop model training courses to assist in the implementation of the Convention and in achieving a more rapid transfer of information and skills regarding new developments in maritime technology. IMO training advisers and consultants also subsequently determined from their visits to training establishments in developing countries that the provision of model courses could help instructors improve the quality of their existing courses and enhance their implementation of the associated Conference and IMO Assembly resolutions.

In addition, it was appreciated that a comprehensive set of short model courses in various fields of maritime training would supplement the instruction provided by maritime academies and allow administrators and technical specialists already employed in maritime administrations, ports and shipping companies to improve their knowledge and skills in certain specialized fields. With the generous assistance of the Government of Norway, IMO developed model courses in response to these generally identified needs and now keeps them updated through a regular revision process taking into account any amendments to the requirements prescribed in IMO instruments and any technological developments in the field.

These model courses may be used by any training institution and, when the requisite financing is available, the Organization is prepared to assist developing countries in implementing any course.

K. SEKIMIZU
Secretary-General



Introduction

■ Purpose of the model courses

The purpose of the IMO model courses is to assist maritime training institutes and their teaching staff in organizing and introducing new training courses, or in enhancing, updating or supplementing existing training material where the quality and effectiveness of the training courses may thereby be improved.

It is not the intention of the model course program to present instructors with a rigid “teaching package” which they are expected to “follow blindly”. Nor is it the intention to substitute audio-visual or “programmed” material for the instructor’s presence. As in all training endeavours, the knowledge, skills and dedication of the instructor are the key components in the transfer of knowledge and skills to those being trained through IMO model course material.

Because educational systems and the cultural backgrounds of trainees in maritime subjects vary considerably from country to country, the model course material has been designed to identify the basic entry requirements and trainee target group for each course in universally applicable terms, and to specify clearly the technical content and levels of knowledge and skill necessary to meet the intent of IMO conventions and related recommendations.

■ Use of the model course

To use the model course the instructor should review the course plan and detailed syllabus, taking into account the information provided under the entry standards specified in the course framework. The actual level of knowledge and skills and the prior technical education of the trainees should be kept in mind during this review, and any areas within the detailed syllabus which may cause difficulties because of differences between the actual trainee entry level and that assumed by the course designer should be identified. To compensate for such differences, the instructor is expected to delete from the course, or reduce the emphasis on, items dealing with knowledge or skills already attained by the trainees. He should also identify any academic knowledge, skills or technical training which they may not have acquired.

By analysing the detailed syllabus and the academic knowledge required to allow training in the technical area to proceed, the instructor can design an appropriate preentry course or, alternatively, insert the elements of academic knowledge required to support the technical training elements concerned at appropriate points within the technical course.

Adjustment of the course objectives, scope and content may also be necessary if in your maritime industry the trainees completing the course are to undertake duties which differ from the course objectives specified in the model course.

Within the course plan the course designers have indicated their assessment of the time that should be allotted to each learning area. However, it must be appreciated that these allocations are arbitrary and assume that the trainees have fully met all entry requirements of the course. The instructor should therefore review these assessments and may need to re-allocate the time required to achieve each specific learning objective.

■ Lesson Plans

Having adjusted the course content to suit the trainee intake and any revision of the course objectives, the instructor should draw up lesson plans based on the detailed syllabus. The detailed syllabus contains specific references to the textbooks or teaching material proposed for use in the course. Where no adjustment has been found necessary in the learning objectives of the detailed syllabus, the lesson plans may simply consist of the detailed syllabus with keywords or other reminders added to assist the instructor in making his presentation of the material.

■ Presentation

The presentation of concepts and methodologies must be repeated in various ways until the instructor is satisfied that the trainee has attained each specified learning objective. The syllabus is laid out in learning-objective format and each objective specifies what the trainee must be able to do as the learning outcome.

■ Implementation

For the course to run smoothly and to be effective, considerable attention must be paid to the availability and use of:

- Properly qualified instructors
- Support staff
- Rooms and other spaces
- Equipment
- Textbooks, technical papers
- Other reference material

Thorough preparation is the key to successful implementation of the course. IMO has produced “Guidance on the Implementation of IMO Model Courses,” which deals with this aspect in greater detail and is included as an attachment to this course.

Part A: Course Framework

■ Scope

This model course intends to provide the knowledge, skill and understanding of ECDIS and electronic charts to the thorough extent needed to safely navigate vessels whose primary means of navigation is ECDIS. The course emphasizes both the application and learning of ECDIS in a variety of underway contexts.

The course is designed to meet the STCW requirements in the use of ECDIS, as revised by the 2010 Manila Amendments, specifically as these apply to Tables A-II/1, A-II/2 and A-II/3, and also to revised guidelines pertaining to training and assessment in the operational use of ECDIS in Table B-I (paragraphs 36 through 66), assessment in navigational watchkeeping, and evaluation of competence, both in Table B-II.

It should be understood that this is a generic course which requires a structured and complementary on-board ship specific ECDIS familiarization for each shipboard ECDIS system on which the navigating officer serves.

■ Objective

Those who successfully complete this course should be able to demonstrate sufficient knowledge, skill and understanding of ECDIS navigation and electronic charts to undertake the duties of a navigational watch officer defined by STCW Code, as amended. This knowledge, skill and understanding should include Column 1 ECDIS competencies of Tables A-II, but is not limited to:

- Knowledge of the capability and limitations of ECDIS operations, and all indicated sub-topics
- Proficiency in operation, interpretation, and analysis of information obtained from ECDIS, and all indicated sub-topics
- Management of operational procedures, system files and data, and all indicated sub-topics

■ Entry Standards

It is assumed that trainees undertaking this course have accomplished some formal instruction in Terrestrial Navigation, have at minimum some familiarization with visual navigation, have accomplished a period of supervised bridge watch-keeping duties, and have prior completion of basic Radar/ARPA (MC 1.07). Trainees should also have considerable familiarization with personal computing operating systems, keyboards and mice or trackballs.

■ Course Certificate, diploma or document

Documentary evidence should be issued to those who have successfully completed this course indicating that the holder has completed training in the navigational use and operation of Electronic Chart Display and Information Systems (ECDIS) based on this model course.

■ Course delivery

The outcome of this course may be achieved through various methods, including simulation-based classroom and laboratory training, or in-service training, or combinations of these methods, such that each trainee is provided access to an ECDIS with ENC data for all required hours of practice and assessment in a controlled visual underway navigational environment.

Methods of distance learning or computer-based training may be used to supplement the familiarization stages of this course, but should not be substituted for the underway assessment of proficiency.

■ Course intake limitations

The maximum number of trainees should depend on the facilities and equipment available, bearing in mind the scope and objectives of this course.

The instructor – trainee ratio should be limited to 1:12. When a class size exceeds 12 trainees, an assistant instructor is required.

■ Staff requirements

The following are the minimum qualifications recommended for instructors delivering a course that follows the IMO Model Course 1.27. The instructor in charge should:

- .1 hold relevant certificate of competency in the deck department or other qualification or experience at the discretion of the administration approving the course;
- .2 have successfully completed an approved ECDIS course;
- .3 have completed type specific familiarization relevant to the equipment used for training;
- .4 have a detailed knowledge of the requirements of SOLAS chapters V/2, V/19, and V/20-27, as amended;
- .5 have an up-to-date knowledge of the IMO ECDIS Performance Standards currently in force and knowledge of relevant STCW requirements and guidance;
- .6 have an up-to-date knowledge of ENCs.
- .7 be fully aware of current ENC data transfer standards and presentation libraries of the IHO, methods of ENC licensing and updating and current IMO recommendations on ECDIS software and other issues;
- .8 have a current relevant teaching qualification or have successfully completed a Train-The-Trainer course, including the application of simulators in training and meets the requirements of STCW regulation I/6 and I/12.

Assistant instructors should have relevant knowledge of ECDIS operation.

■ Teaching Facilities and equipment

ECDIS simulation equipment must meet all applicable performance standards set out in Regulation I/12 of the STCW Convention and also should meet the guidance in Section B-I/12, as amended.

An example of equipment set up for ECDIS training has been provided in appendix 6.

ECDIS Classroom/Lab.

The lecture portion of the course can take place in any suitable classroom with adequate desk/seating space for all trainees. Standard classroom facilities must be available such as whiteboard/chalkboard, appropriate projection system, etc.

The practical demonstration and assessment portion of the course must take place in a space equipped to provide a suitable ECDIS simulator work station for each individual trainee. The necessity of mounting display monitors on the desk surfaces requires careful placement of all equipment and projection screens to maintain good visibility for all trainees.

In addition to the trainee work stations there must be an instructor station with dedicated projection system that will allow projection of the exercises and lecture materials. It is strongly recommended that there be display(s) networked to the instructor station, thereby allowing display(s) of ARPA and ECDIS information (or other training material) for the benefit of the trainees.

Note that the lecturing may take place in the same room as the simulation if the space is suitable. This would require adequate visibility around/over the workstations to the whiteboard/chalkboard and projection screens, and adequate work space for taking notes and written examinations.

■ Teaching aids (A)

- A1 Instructor Manual (Part D of the course)
- A2 Audiovisual aids: Video/DVD player, visual presentation, document projector, etc.
- A3 Simulator providing ownship functionality in an underway navigational context
- A4 ECDIS workstation including ENC data, deriving inputs from simulation or live sensors
- A5 Electronic Navigational Chart (ENC) data, various, including permits, and update files
- A6 Raster Navigational Charts (RNC) including permits and updates

■ Bibliography (B)

- B1 NMEA Interface Standard 0183 v.3.01 (Severna Park, MD, National Marine Electronic Association, 1/2002)
- B2 Facts about electronic charts and carriage requirements, 2nd Ed. (Finnish Maritime Administration: Primar Stavanger and IC-ENC, 5/2007)
- B3 Gale, H. (2009) From Paper Charts to ECDIS. London: Nautical Institute
- B4 Bole, et al. (2005) The Radar/ARPA Manual, 2nd ed., Chapter 10 "Ancillary Equipment". Burlington, MA: Elsevier

- B5 American Practical Navigator (Bowditch, Pub. No. 9), 2002 Ed., Chapter 14 “Electronic Charts”
- B6 Simulator reference manual (Manufacturer, Date)
- B7 User’s manual accompanying the ECDIS software utilized during the training course
- B8 IEC 61174 – Maritime navigation and radiocommunication equipment and systems – Electronic chart display and information system (ECDIS) – Operational and performance requirements, methods of testing and required test results, Edition 3.0, International Electrotechnical Commission
- B9 IHO S-66, Facts about electronic charts and carriage requirements, Edition Jan 2010
- B10 IHO S-61, Product specifications for Raster Navigational Charts, Edition 1.0
- B11 IHO S-52 Specifications for chart content and display aspects of ECDIS, 5th ed., as amended (IHB, 12/2001)
- B12 IHO S-100 Universal Hydrographic Data Model, Ed. 1.0.0 (Monaco: IHB, 1/2010)
- B13 IHO S-57, Electronic Navigational Chart (ENC), Edition 3.1

■ Electronic media (E)

- E1 ECDIS, Seagull CBT, CD #64
- E2 AIS, Seagull CBT, CD #109 v.A, 8/2003
- E3 ECDIS Training Course, Videotel CBT #871, 5/2008

■ IMO references (R)

- R1 Standards of Training, Certification and Watchkeeping for Seafarers (STCW Convention), as amended
- R2 1974 SOLAS Convention, Regulations V/19, V/20 and V/27, as amended 2009, IMO Res. MSC 282(86)
- R3 Revised ECDIS Performance Standards, MSC.232(82), IMO, 12/2006
- R4 ECDIS Performance Standards, IMO Resolution A.817(19) as adopted 11/1995, including Appendices 1 – 5, Appendix 6 as adopted 11/1996 Res. MSC.64(67), and Appendix 7 as adopted 12/1998 Res. MSC.86(70)
- R5 IMO MSC.1/Circ.1391, Operating anomalies identified within ECDIS
- R6 IMO SN.1/Circ.266/Rev. 1, Maintenance of Electronic Chart Display and Information System (ECDIS) Software
- R7 Guidelines for Voyage Planning, IMO Res. A.893(21)
- R8 COLREGS – International Regulations for Preventing Collisions at Sea, 1972, as amended

■ Textbooks (T)

- T1 Norris, A. (2010) ECDIS and Positioning. London: The Nautical Institute
- T2 Weintrit, A. (2009) The Electronic Chart Display and Information System (ECDIS): An Operational Handbook. Gdynia: Gdynia Maritime University, Poland, Balkema Book, CRC Press, Taylor & Francis Group
- T3 Hecht, et al. (2011) The Electronic Chart, Fundamentals, Functions, Data and other Essentials A Textbook for ECDIS Use and Training (3rd Revised Edition) Lemmer, The Netherlands: Geomares Publishing
- T4 The ECDIS Manual, ECDIS Ltd, Witherby Seamanship International, Edition 2012

Part B: Course Outline and Timetable

■ Overview

The following section presents the topics of the 40-hour ECDIS course in a simplified outline format. The 37 topics are organized into 5 general Subject Areas. The total hours are allocated in the following manner:

Practice & Lecture	Independent ECDIS navigation	Evaluation
29.0 hrs	8.0 hrs	3.0 hrs

The duration allocated to each topic is presented in the Course Timetable, and is repeated in Part C – Detailed Teaching Syllabus, and in Part D – Lesson Plans and Exercises. The Learning Objectives for each topic are presented generally in Part C, and with full detail in Part D.

As defined in Part A – Course Framework, the Classroom setting should provide one workstation for each trainee, and all workstations should be networked to the simulation instructor and server.

■ Course Outline

Subject Area and topics	Hours
Elements of ECDIS 1. Course introduction & familiarization plan 2. Purpose of ECDIS 3. Value to navigation 4. Correct & incorrect use 5. Workstation start, stop & layout 6. Vessel position 7. Position source 8. Basic navigation 9. Heading & drift vectors Ex.1 Simulator exercise – open sea (basic integrated navigation) 10. Understanding chart data 11. Chart quality & accuracy 12. Chart organization	9.5

Subject Area and topics	Hours
Watchkeeping with ECDIS 13. Sensors 14. Ports & data feeds 15. Chart selection 16. Chart information 17. Changing the settings 18. Chart scaling 19. Information layers Ex.2 Simulator exercise – coastal waters (chart display settings) 20. System & position alarms 21. Depth & contour alarms	9.0
ECDIS Route Planning and Monitoring 22. Vessel manoeuvring characteristics 23. Route planning by table 24. Route planning by chart 25. Track limits 26. Checking plan for safety Ex.3 Simulator exercise – coastal & restricted waters (navigation alarms & route scheduling) 27. Additional Navigational Information 28. Route schedule 29. User charts in route planning	9.0
ECDIS Targets, Charts & System 30. ARPA/Radar overlay 31. AIS functions 32. Procuring & installing chart data 33. Installing chart corrections Ex.4 Simulator exercise – restricted waters (advanced integrated navigation with ECDIS) 34. System reset & backup 35. Archiving ECDIS data and data logging	6.5
ECDIS Responsibility & Assessment 36. Responsibility 37. Effective navigation with ECDIS Ev.1 Written evaluation Ev.2 Simulator exercise – coastal & restricted waters (underway ECDIS navigation assessment)	6.0
Total	40.0

■ Course Timetable

Day/ Period	1st Period (2.0 hours)	2nd Period (2.0 hours)	3rd Period (2.0 hours)	4th Period (2.0 hours)
Day 1	Elements of ECDIS 1. Course introduction & familiarization plan 2. Purpose of ECDIS 3. Value to navigation 4. Correct & incorrect use	5. Workstation start, stop & layout 6. Vessel position 7. Position source	8. Basic navigation 9. Heading & drift vectors 10. Understanding chart data	Ex.1 Simulator exercise – open sea (basic integrated navigation)
Day 2	11. Chart quality & accuracy 12. Chart organization Watchkeeping with ECDIS 13. Sensors 14. Ports & data feeds	15. Chart selection 16. Chart information	17. Changing the settings 18. Chart scaling 19. Information layers	Ex.2 Simulator exercise – coastal waters (chart display settings)
Day 3	20. System & position alarms 21. Depth & contour alarms	ECDIS Route Planning and Monitoring 22. Vessel manoeuvring characteristics 23. Route planning by table	24. Route planning by chart 25. Track limits 26. Checking plan for safety	Ex.3 Simulator exercise – coastal & restricted waters (navigation alarms & route scheduling)
Day 4	27. Additional Navigational Information 28. Route schedule 29. User charts in route planning	ECDIS Targets, Charts & System 30. ARPA/Radar overlay 31. AIS functions	32. Procuring & installing chart data 33. Installing chart corrections	Ex.4 Simulator exercise – restricted waters (advanced integrated navigation with ECDIS)
Day 5	34. System reset & backup 35. Archiving ECDIS data and data logging	ECDIS Responsibility & Assessment 36. Responsibility	37. Effective navigation with ECDIS Ev.1 Written evaluation	Ev.2 Simulator exercise – coastal & restricted waters (underway ECDIS navigation assessment)

Note: Teaching staff should note timetables are suggestions only as regards sequence and length of time allocated to each objective. These factors may be adapted by instructors to suit individual groups of trainees depending on their experience and ability and on the equipment and staff available for training.

Part C: Detailed Teaching Syllabus

The detailed teaching syllabus has been written in learning objective format in which the objective describes what the trainee should do to demonstrate that knowledge has been transferred. All objectives are understood to be prefixed by the words, “The expected learning outcome is that the trainee...”.

In order to assist the instructor, reference publications are shown against the learning objectives in addition technical material and teaching aids, which the instructor may wish to use when preparing course material. The material listed in the course framework has been used to structure the detailed teaching syllabus; in particular:

Teaching aids (indicated by A);
Bibliography (indicated by B);
Electronic media (indicated by E);
IMO references (indicated by R); and
Textbooks (indicated by T)

will provide valuable information to instructors. The abbreviations used are:

add.: addendum
app.: appendix
art.: article
ch.: chapter
encl.: enclosure
p.: page
pa.: paragraph
reg.: regulation
sect.: section
tab.: table

■ Note

Throughout the course, safe working practices are to be clearly defined and emphasized with reference to current international requirements and regulations. It is expected that the institution implementing the course will insert references to national and/or regional requirements and regulations as necessary.

■ Learning Objectives

Subject Areas and topics have been outlined in Part B. In Part C, the Learning Objectives associated with each topic are provided, along with teaching aids and references. In Part D, the topics are referred to as Lesson Plans, and the Learning Objectives are further described in sufficient detail for the development of an ECDIS Instructor’s Manual. The Learning Objectives are presented in a verb-based manner to facilitate outcomes-driven learning and skills development. All Learning Objectives are understood to be prefixed by the phrase: “The expected learning outcome is that the trainee is able to . . .”.

Bear in mind that the overarching competencies to be developed throughout the course are the “use of ECDIS to maintain the safety of navigation” (STCW, A-II/1, A-II/3, Operational Level) and “maintain the safety of navigation through the use of ECDIS and associated navigation systems to assist command decision making” (STCW, A-II/2, Management Level). The ECDIS instructor should strive to present all of the Learning Objectives in or as close to the contexts of underway navigation as possible. Through practice and understanding of these Learning Objectives as tasks to master and apply, the trainee achieves the desired competence and which the instructor may assess in the scored final underway evaluation.



Knowledge, Understanding and Proficiency	Teaching Aid	Reference
Elements of ECDIS (9.5 hours)		
1. Course introduction & familiarization plan (0.5 hour)	A1	T3 ch.1
1.1. General introductions	A3	B6
1.2. Administration	A4	B7
1.3. Familiarization with ECDIS learning environment		
2. Purpose of ECDIS (0.5 hour)	A1	R3
2.1. Introduce revised IMO Performance Standards for ECDIS (June 2006, Resolution MSC.232(82))	A2	T1 ch.3 & 10.3
	A3	T3 ch.2
2.2. Differentiate between display options	A4	B4 ch.10.2
2.3. Identify information types and areas on navigation display	A5	B5 ch.14
2.4. Apply presentation of ECDIS data		
3. Value to navigation (0.5 hour)	A1	T1 ch.6.8
3.1. Recognize factors that characterize and modify chart presentation	A2	T1 ch.8.5
	A3	T3 ch.11.1 & 11.2
3.2. Recognize factors that characterize and modify the data quality	A4	B4 ch.11.2.2 & 11.2.3 & 11.3
	A5	
3.3. Manually change scale, area & position of ownship		
3.4. Evaluate the route monitoring mode of ECDIS operation		
3.5. Explain the value of ECDIS to navigation		
4. Correct & incorrect use (0.5 hour)	A1	T1 ch.8.7
4.1. Use ECDIS within the prevailing navigation situation	A2	T3 ch.11.3.2 & 7.5 & 8.1.1
4.2. Recognize ways to avoid over-reliance on ECDIS	A3	B2
4.3. Proficiency in the use of ECDIS includes assessing the integrity of the system and all data at all times	A4	B3
	A5	
5. Workstation start, stop & layout (0.5 hour)	A1	T1 ch.1
5.1. Perform standard ECDIS workstation start	A2	T3 ch.7.3
5.2. Interpret the ECDIS start windows for sensors requested, sensors found, and selected chart data initializing	A3	B7
	A4	
5.3. Examine alarms (if any) and determine initial conditions of ECDIS readiness for navigation	A5	
6. Vessel position (0.5 hour)	A1	T1 ch.6.7
6.1. Review user interface methods	A2	B7
6.2. Review display of vessel's position	A3	
6.3. Examine position information in the display panels	A4	
6.4. Determine a position fix on the ECDIS chart display panel	A5	
7. Position source (1.0 hour)	A1	T1 ch.2
7.1. Review basics of GNSS	A2	T3 ch.7.5.5 & 8.1.1
7.2. Coordinate GNSS antenna position settings	A3	B7
7.3. Select position system	A4	
7.4. Determine fix quality (status) of GNSS	A5	

Knowledge, Understanding and Proficiency	Teaching Aid	Reference
8. Basic navigation (1.0 hour)	A1	T1 ch.6.2
8.1. Activate display categories and information layers	A2	B7
8.2. Monitor vessel safety	A3	
8.3. Activate route monitoring features	A4	
	A5	
9. Heading & drift vectors (0.5 hour)	A1	T1 ch.8.1
9.1. Activate vessel's motion vectors	A2	R3
9.2. Obtain vessel's course and speed from the positioning system	A3	R4
9.3. Interpret the movement of the vessel	A4	B7
9.4. Recognize the effects of gyro error	A5	
9.5. Graphically monitor ownship's approach to isolated dangers by means of a guard ring		
Ex.1 Simulator exercise – open sea (basic integrated navigation) (2.0 hours)	A3, A4, A5	
10. Understanding chart data (1.0 hour)	A1	T1 ch.1 & 4
10.1. Define the relevant terminology of ECDIS	A2	T3 ch.4 & 7.2
10.2. Describe the differences between electronic chart systems and ECDIS	A3	& 6
10.3. Describe the various electronic chart data formats	A4	B5 ch.14
10.4. Explain the relationship between ECDIS data and the information presented on the display	A5	B7
10.5. Explain that only information stored as objects with corresponding attributes in the database is available for display	A6	B10
10.6. Describe the chart data selected for display		
11. Chart quality & accuracy (0.5 hour)	A1	T1 ch.9
11.1. Explain what the accuracy of chart data is dependent upon	A2	T3 ch.5
11.2. Explain the problems in ECDIS associated with variant datums	A3	B7
11.3. Assess all errors, inaccuracies and ambiguities caused by improper data management	A4	
11.4. Explain the need and requirement that electronic chart data must be systematically updated for safe navigation	A5	
11.5. Demonstrate issues pertaining to computer monitor display resolution		
12. Chart organization (0.5 hour)	A1	T1 ch.6.3
12.1. Introduce the organization of chart data distribution	A2	T3 ch.10 &
12.2. Demonstrate the loading (retrieval) of ECDIS data	A3	7.2.2
	A4	B7
	A5	

Knowledge, Understanding and Proficiency	Teaching Aid	Reference
Watchkeeping with ECDIS (9.0 hours)		
13. Sensors (0.5 hour)	A1	T1 ch.2.16 & 6.1 & 6.5.1
13.1. Explain the performance limits of devices for position, course over ground, heading, speed, depth, radar, and AIS	A2	
	A3	T3 ch.8
13.2. Explain the need for selecting sensor data displayed in ECDIS that is appropriate, unambiguous and accurate	A4	B7
	A5	
13.3. Evaluate the impairment of ECDIS performance when sensor performance deteriorates or fails		
13.4. Explain and analyse various sensor alarms and indications		
14. Ports & data feeds (0.5 hour)	A1	T1 ch.8.2 & 8.3
14.1. Select between primary and secondary position source	A2	B4 ch.10.4
14.2. Observe automatic change over to secondary position source	A3	B7
	A4	
14.3. Explain the data reference system of each connected sensor	A5	
14.4. Identify the data port assigned to each connected sensor		
14.5. Monitor, identify and to a limited extent decode the data stream for each attached sensor		
14.6. Assess the plausibility of sensor input values to ECDIS		
14.7. Assess the impact on displayed information when a sensor port is improperly selected		
15. Chart selection (0.5 hour)	A1	T1 ch.6.4 & 9.1
15.1. Demonstrate the variety of methods that chart data can be loaded and changed	A2	T3 ch.5.3 & 7.2
	A3	B7
15.2. Assess the inaccuracies and ambiguities caused by improper selection of a chart for display	A4	B8
	A5	
15.3. Display updates in order to review content and to establish their inclusion in the SENC		
15.4. Explain and analyse the data and chart alarms resulting from over-scaling		
15.5. Explain and analyse the data and chart alarms resulting from use of a non-WGS84 datum		
16. Chart information (1.0 hour)	A1	T1 ch.6.4.6
16.1. Select the task panel and apply the functions suitable for position monitoring, route monitoring, route creation and editing, trial manoeuvre, creating and accessing user-defined layers	A2	T3 ch.7.2
	A3	B7
	A4	B10
	A5	
16.2. Obtain information on charted objects	A6	
16.3. Demonstrate how the presentation of navigation marks is changed according to ownship position		
16.4. Demonstrate errors of interpretation by the incorrect selection of display categories		

Knowledge, Understanding and Proficiency	Teaching Aid	Reference
17. Changing the settings (1.0 hour)	A1	T1 ch.6.3 & 8.6
17.1. Manually test the major functions of hardware, keyboard, mouse/trackball, sensor data, and chart data	A2	T3 ch.7.6
17.2. Check and/or select preferred operational settings in the primary task panels and on the primary information panel	A3	B7
17.3. Evaluate alarm and function status indications	A4	
17.4. Demonstrate errors of interpretation by the incorrect selection of safety values	A5	
17.5. Adjust track length and precision		
17.6. Evaluate the range of information recorded in the log table (voyage recording)		
18. Chart scaling (0.5 hour)	A1	T1 ch.6.4
18.1. Demonstrate scaling of electronic chart display	A2	T3 ch.7.2.4
18.2. Apply the automatic changing of chart scale ratio	A3	B7
18.3. Apply additional chart scale information	A4	
18.4. Recognize interpretation errors due to scaling	A5	
19. Information layers (1.0 hour)	A1	T1 ch.6.5 & 6.9
19.1. Observe effect on information layers and status indications when chart data is loaded and when chart area is underscaled	A2	& 7.3
19.2. Review and apply appropriate day/night palette, display category, and scale	A3	T3 ch.7.5.6 & 7.2.1 & 7.3.2
19.3. Select information options in display category of "All other information"	A4	B7
19.4. Differentiate between information layers, user chart layers, and event graphic	A5	
19.5. Respond to the indicators representing the loss of displayed information		
Ex.2 Simulator exercise – coastal waters (chart display settings) (2.0 hours)	A3, A4, A5	
20. System & position alarms (0.5 hour)	A1	T1 ch.8.3
20.1. Identify and respond to alarms for primary and secondary positioning systems	A2	T3 ch.7.5.3
20.2. Identify and respond to chart related alarms	A3	B7
20.3. Identify and respond to ECDIS alarms from autopilot in Track Control	A4	
	A5	
21. Depth & contour alarms (1.5 hours)	A1	T1 ch.8.4 & 6.5
21.1. Describe route monitoring alarms	A2	T3 ch.7.5
21.2. Identify depth-related information	A3	B7
21.3. Set the safety values for route monitoring	A4	
21.4. Set the limits pertaining to safe water	A5	

Knowledge, Understanding and Proficiency	Teaching Aid	Reference
ECDIS Route Planning and Monitoring (9.0 hours)		
22. Vessel manoeuvring characteristics (0.5 hour)	A1	T1 ch.8.5
22.1. Determine methods of alert for wheel over when approaching waypoints	A2	T3 ch.7.5 & 8.3
	A3	B7
22.2. The navigator must verify positioning especially when ECDIS is connected to autopilot	A4	
	A5	
23. Route planning by table (1.0 hour)	A1	T1 ch.7.1 & 7.5
23.1. Retrieve a stored route plan	A2	T3 ch.7.4
23.2. Approve an existing route for planning, safety review and monitoring	A3	B7
	A4	
23.3. Select the sea areas and the required waters for planning the whole passage	A5	
23.4. Construct a route plan by inputting waypoint data alphanumerically into a route-planning table		
23.5. Adjust the route plan by editing, adding and deleting waypoints inside the table		
23.6. Adjust curved track planning and wheel over indication		
23.7. Establish procedures to name, link, rename, archive, retrieve and delete route files		
24. Route planning by chart (2.0 hours)	A1	T1 ch.7.2 & 7.3
24.1. Select the sea areas and the required waters for planning the whole passage	A2	T3 ch.7.4
	A3	B7
24.2. Construct a route by inputting waypoints directly on the ECDIS display	A4	
	A5	
24.3. Adjust the route by graphically editing waypoints		
24.4. Obtain track courses and distances from the chart		
24.5. Obtain relevant route planning information		
25. Track limits (0.5 hour)	A1	T1 ch.6.5.3 & 8.3
25.1. Review the alarm settings used as vessel is proceeding along a monitored route	A2	T3 ch.7.5
	A3	B7
25.2. Modify the setting of XTE in a previously saved route	A4	
	A5	
26. Checking plan for safety (0.5 hour)	A1	T1 ch.7.4 & 7.7
26.1. Check a previously created and saved route for crossing dangers of navigation according to the setting of cross-track distance	A2	T3 ch.7.4
	A3	B7
	A4	
26.2. Check the route as it is being created for dangers as listed above	A5	
26.3. Assess a route plan based on a safety check		
Ex.3 Simulator exercise – coastal & restricted waters (navigation alarms & route scheduling) (2.0 hours)	A3, A4, A5	
27. Additional Navigational Information (0.5 hour)	A1	T3 ch.7.5 & 7.7 & 15.1
27.1. Discuss various hydro-meteorological data that could be available in the ECDIS database (tides, currents, weather, etc.)	A2	B7
	A3	
	A4	
	A5	

Knowledge, Understanding and Proficiency	Teaching Aid	Reference
28. Route schedule (0.5 hour)	A1	T1 ch.7.5
28.1. Observe any deviation from the route schedule setting in use as vessel is proceeding along a route	A2	T3 ch.7.5 & 7.7
	A3	B7
28.2. Determine expected passage times	A4	
28.3. Observe calculations of progress along the planned route	A5	
28.4. Using the ETA application in ECDIS, calculate time or speed at a selected waypoint on a monitored route		
29. User charts in route planning (1.5 hours)	A1	T1 ch.7.3
29.1. Review the ECDIS function for creating mariner's notes (User Chart)	A2	T3 ch.7.3
	A3	B7
29.2. Determine effective policy regarding User Charts	A4	
29.3. Select User Chart for display	A5	
29.4. Use the graphic editor for creating and modifying a User Chart		
29.5. Create, save and move an anchor circle guard zone on a User Chart		
ECDIS Targets, Charts & System (6.5 hours)		
30. ARPA/Radar overlay (0.5 hours)	A1	T1 ch.8.4.3
30.1. Examine sensor setup requirements for ARPA targets	A2	T3 ch.8.2.3 & 8.5
30.2. Determine speed and heading inputs used in ARPA target data calculations	A3	B7
	A4	T1 ch.8.4.4
30.3. Access target information display	A5	T3 ch.8.2.1 & 8.2.2 & 11.1.5
30.4. Interpret target symbol features		
30.5. Operate the user interface controls for radar overlay		
30.6. Demonstrate sources of image offset		
30.7. Determine source of ECDIS-tracked target data calculations		
30.8. Make corrections to own ship's position, using a reference point captured by ARPA.		
31. AIS functions (0.5 hour)	A1	T1 ch.8.4.5 & 6.9
31.1. Describe what the connection of an Automatic Identification System (AIS) to ECDIS enables	A2	T3 ch.8.4
	A3	B4 ch.10.3
31.2. Examine sensor setup requirements for AIS targets	A4	B7
31.3. Determine alarms and other settings for AIS targets	A5	
31.4. Access target information display options		
31.5. Interpret AIS target symbol features		
32. Procuring & installing chart data (1.5 hours)	A1	T1 ch.4.4
32.1. Review chart data structure, terminology, and installation procedures	A2	T3 ch.9.2 & 9.3 & 9.4
	A3	B7
32.2. Review chart format requirements for ECDIS	A4	
32.3. Examine data distribution sources for ENC	A5	
32.4. Examine data distribution sources for SENC conversions		
32.5. Examine licence structure for various formats, and practise installation		
32.6. Extract information on installation history		

Knowledge, Understanding and Proficiency	Teaching Aid	Reference
33. Installing chart corrections (1.0 hour)	A1	T1 ch.4.5 & 6.3
33.1. Explain why electronic chart data is maintained with up-to-date corrections	A2	T3 ch.10
33.2. Add or modify a chart object using Manual Correction task	A3	B7
33.3. Examine production licence options for accessibility of automatic updates	A4	
33.4. Install various automatic update formats using various methods	A5	
33.5. Extract information on update history		
33.6. Apply Temporary and Preliminary Corrections and Navigational Warnings.		
Ex.4 Simulator exercise – restricted waters (advanced integrated navigation with ECDIS) (2.0 hours)	A3, A4, A5	
34. System reset & backup (0.5 hour)	A1	T1 ch.8.7 & 8.8
34.1. Explain the intent of regulations on ECDIS back-up arrangements	A2	T3 ch.11.3 & 11.4
34.2. Discuss back-up procedures in standalone ECDIS failure event	A3	B7
34.3. Discuss networked back-up procedures in (Master) ECDIS failure event	A4	
34.4. Discuss troubleshooting routines in ECDIS	A5	
34.5. Recognize consequences to navigation safety while troubleshooting		
34.6. Recognize consequences to data storage while ECDIS workstation is down		
35. Archiving ECDIS data and data logging (0.5 hour)	A2	T1 ch.8.6
35.1. Discuss ECDIS data management to work with files associated with ECDIS operations	A4	T3 ch.7.6 & 13.9
35.2. Discuss ECDIS data management to transfer selected data files between storage media	A1	B7
35.3. Examine requirements and functions of logbook task in ECDIS	A3	
35.4. Examine display functions of ownship track and tracks of AIS, and ARPA targets	A5	
35.5. Perform various hard copy print outs		

Knowledge, Understanding and Proficiency	Teaching Aid	Reference
ECDIS Responsibility & Assessment (6.0 hours)		
36. Responsibility (2.0 hours)	A1	R1
36.1. Review COLREGS	A2	R3
36.2. Review SOLAS, as amended		B11
36.3. Review IMO approval of equipment and installations		B12
36.4. Review IMO carriage requirements		B13
36.5. Review national ECDIS carriage regulations (if applicable)		R7
36.6. Review STCW Code, as amended		T1 ch.5
36.7. Review flag state (maritime) implementation		T3 ch.13.4
36.8. Review IMO training Guidance (and providing review of course)		
36.9. Review ISM and IMO requirements of ship owners & operators		
36.10. Review IHO relevant regulations.		
36.11. Review the need to ensure that ECDIS software is kept up to date.		
37. Effective navigation with ECDIS (1.0 hour)	A1	T1 ch.10.2
37.1. Describe bridge functions incorporating ECDIS	A2	T3 ch.7.3 & 8.1 & 11.2 & 16
37.2. Re-examine sample bridge operating procedures addressing ECDIS		R5, R6
37.3. Define safe and practical navigation with ECDIS		
37.4. Knowledge of the anomalies that ECDIS is susceptible to		
Ev.1 Written evaluation (1.0 hour)		
Ev.2 Simulator exercise – coastal & restricted waters (underway ECDIS navigation assessment) (2.0 hours)	A3, A4, A5	

Part D: Instructor Manual

■ Guidance for instructors

The course outline and timetable (Part B) provide guidance on the time allocation for the course material, but the instructor is free to modify this if it is deemed necessary. The detailed teaching syllabus (Part C) must be studied carefully and, where appropriate, lesson plans or lecture notes compiled with Part D providing the basis from beginning to end of the course. Evaluation and assessment guidance are provided in Part E.

The lesson plans and exercises of this part are meant to provide the ECDIS navigation instructor with the material for a course instruction manual. Specifically, the Learning Objectives presented in the previous parts of the Model Course document are fleshed out in considerable detail in Part D. The details of this part reflect the views of the course developers with respect to methodology and organization as well as what they consider relevant and important in light of their experience as instructors and as navigator who have succeeded in applying ECDIS to bridge watchkeeping. Although the lessons, exercises, and assessment methods should be of value initially, each instructor should develop his/her own methods and ideas, recognize and refine what is successful, and discard that which does not work satisfactorily. It is particularly important for the instructor to adapt content to the specific ECDIS being utilized in the training environment. Despite the ECDIS Performance Standards, there is limited commonality among type-approved ECDIS units. Adaptation is also advised for review of flag state regulations, as appropriate.

As noted in the foregoing parts, this 40-hour course is comprised of 40 Lesson Plans, 4 practice exercises, and a final underway assessment exercise. These are divided according to the five primary stages of the course:

- 1 Elements of ECDIS (9.5 hours)
- 2 Watchkeeping with ECDIS (9.0 hours)
- 3 ECDIS Route Planning (9.0 hours)
- 4 ECDIS Charts, Targets & System (6.5 hours)
- 5 ECDIS Responsibility (6 hours)

Preparation and planning are the most important criteria in effectively presenting this course. Availability and proper use of course materials is also essential for maximum efficacy in conveying the subject to trainees. The capabilities and limitations of the teaching facilities in use may dictate that the learning objectives be adjusted but it is suggested that this be kept to a minimum.

Due to the considerable challenges and complexities faced by trainees learning to navigate safely using ECDIS, it is vital for the instructor to recognize that successful underway assessments require as much hands-on practice as possible. As discussed in the Introduction to the navigational use of ECDIS (2010 Edition), lecturing and demonstration and the opportunity for individual use applies to nearly all learning objectives in nearly all topics. It will be necessary for instructors to prepare for the presentation of specific learning objectives in the context of underway scenarios for both classroom demonstration and practice, and for the independent navigation environment. The development of other materials, such as

- Use the projector to show how you will demonstrate ECDIS functions,
- Explain how to get information from the ECDIS User Manuals,
- Explain Help structure within ECDIS software package, and
- Briefly tour classroom and lab used for ECDIS navigation training to see navigation and control equipment.

2. Purpose of ECDIS (0.5 hr)

The instructor explains the main characteristics of ECDIS data display, and recognizes which information is constantly displayed by ECDIS and which is selectable (Refs: R3; T1 ch.3 & 10.3; T3 ch.2; B4 ch.10.2; B5 ch.14).

2.1. Introduce revised IMO Performance Standards for ECDIS (June 2006, Resolution MSC.232(82)):

- ECDIS definition,
- Capability of displaying all chart information necessary for safe and efficient navigation,
- Swiftly enables positioning, route monitoring and route planning,
- Provides appropriate alarms and indications.

2.2. Differentiate between display options:

- Electronic navigational chart (ENC) and system ENC (SENC),
- Standard display and display base,
- Display of information other than ENC data.

2.3. Identify information types and areas on navigation display:

- Electronic chart area, Information area, Task panels, other menu options,
- Automatic displays for monitoring ship's safety including position, gyro heading, speed log, time, and safety values, course over ground and speed over ground.

2.4. Apply presentation of ECDIS data:

- Major rules of presentation library,
- Automatic presentation, such as scale, display category, day/night, etc.,
- Modes, such as true motion and North-up.

3. Value to navigation (0.5 hr)

The trainee recognizes that safe navigation with ECDIS requires the selection and analysis of displayed information that is relevant to the prevailing situation (Refs: T1 ch.6.8; T1 ch.8.5; T3 ch.11.1 & 11.2; B4 ch.11.2.2 & 11.2.3 & 11.3).

3.1. Recognize factors that characterize and modify chart presentation:

- Projection, colours, symbols,
- Assessment of differences.

3.2. Recognize factors that characterize and modify the data quality:

- Accuracy, resolution, completeness,
- Assessment of differences.

3.3. Manually change scale, area & position of ownship:

- Chart (or sea) area and scale,
- Position of ownship relative to display edge

3.4. Evaluate the route monitoring mode of ECDIS operation:

- Route monitoring mode,
- Navigation mode.

3.5. Explain the value of ECDIS to navigation:

- Ownship position with respect to route, shipping lanes, acquired targets, depth contours, soundings, and predicted tides and currents,
- Multi-chart loading, scaling, on-chart object information,
- Centralized information station for navigational bridge team, including ERBL, user layers, radar target tracking, SAR, Navtex, AIS, climate, and port information.

4. Correct & incorrect use (0.5 hr)

The trainee assesses the role of ECDIS within the totality of the navigation process (Refs: T1 ch.8.7; T3 ch.11.3.2 & 7.5 & 8.1.1; B2; B3).

4.1. Use ECDIS within the prevailing navigation situation:

- Name the principles of navigation and operational guidance for officers in charge of a navigational watch (STCW, SOLAS),
- Review the many areas of bridge operations to which ECDIS may be applied,
- Situational awareness includes the functioning of navigational aids and the reliability of sensors,
- ECDIS is a powerful and comprehensive navigational system yet its use does not eliminate the need to verify the information using other means
- A navigational watch is not to be performed on only one system (mostly unavoidable in this simulation and proficiency training).

4.2. Recognize ways to avoid over-reliance on ECDIS:

- A system malfunction and data inaccuracy is always a potential,

- The displayed hydrographic data are not more reliable than the survey data they are based on,
- The displayed sensor data are not more reliable than the respective originating sensor system,
- Errors/inaccuracies in one subsystem may degrade others and can potentially render ECDIS useless.

4.3. Proficiency in the use of ECDIS includes assessing the integrity of the system and all data at all times.

- However, such use should be integrated into standing a normal watch including a competent visual lookout, and the continued maintenance of good situational awareness.
- One method of accomplishing this is to go to the ECDIS with a single purpose or query within a strict and brief time limit, rather than to browse or surf menus and information panels. Keeping to a 7-second glance as a scanning technique helps produce an integrative role for ECDIS.
- Another method is to overcome the problem of partial use – the less thoroughly the ECDIS is used and applied, the less willing the users become to apply ECDIS to navigation, resulting in less familiarity and less trust.

5. Workstation start, stop & layout (0.5 hr)

The trainee analyses and assesses the proper functioning of ECDIS during the booting-up process and normal operation (Refs: T1 ch.1; T3 ch.7.3; B7).

5.1. Perform standard ECDIS workstation start:

- Recognize that some sensor feeds may need to be off or disconnected from ECDIS workstation com ports, and that the ECDIS workstation is subject to all normal limitations of hardware, operating system, and memory
- ECDIS is a navigation aid and has:
 - Potential limitations in hard drive storage, RAM size, power supply interruptions, hardware malfunctions, overall system lockup, etc.,
 - Operating system (typically Windows) boot-up procedures and internal tests,
 - A pre-programmed “dongle” installed in the parallel printer port which enables the registration and use of the ECDIS manufacturer’s products,
 - The potential to fail due to incorrect use of OS and ECDIS software.

5.2. Interpret the ECDIS start windows for sensors requested, sensors found, and selected chart data initializing:

- Recognize the significance of the ECDIS Activator Key (dongle) and associated licence files

- The ECDIS software boots up (loads) with:
 - A small indicator window against the desktop background, then
 - A full screen panel indication of initialization, then
 - The ECDIS basic display with alarm indicators (if any) requiring acknowledgement.

5.3. Examine alarms (if any) and determine initial conditions of ECDIS readiness for navigation

- The ECDIS initialization screen indicates on-line tests:
 - For date/time, position, heading, and speed log,
 - Displays “Received” when these inputs match expected protocols (“Received” status is not a check on data accuracy),
 - Displays “Aborted” when these inputs are missing or corrupt,
 - Boot-up without inputs will continue, with alarms on ECDIS display,
 - ENC data will be loaded from the chart files as licensed.

6. Vessel position (0.5 hr)

The trainee operates basic navigational functions and settings pertaining to vessel position information (Refs: T1 ch.6.7; B7).

6.1. Review user interface methods:

- Mouse/trackball and device buttons,
- Keyboard and hotkeys,
- Control of standard cursor and free mouse cursor,
- Use of cursor and ERBL on the display.

6.2. Review display of vessel's position:

- Shift the vessel on the display in navigation mode,
- Vessel's symbols,
- Vessel's GNSS position information (details reviewed in Lesson 07),
- Track of vessel's position (details reviewed in Lesson 08),
- Vessel's motion vectors (details reviewed in Lesson 09).

6.3. Examine position information in the display panels:

- System (tidal height, current, sounding, set and drift at position),
- Route (vessel position on the route),
- Pilot (position relative to next WP as per route schedule data).

6.4. Determine a position fix on the ECDIS chart display panel:

- Manually draw and move bearing lines (LOPs),
- Manually mark position on the display.

7. Position source (1.0 hr)

The trainee recognizes the principal features of GNSS as the primary vessel position source (Refs: T1 ch.2; T3 ch.7.5.5 & 8.1.1; B7).

7.1. Review basics of GNSS:

- Satellite constellation, theory, atmospheric interference,
- Signal quality indication, HDOP, data age, station ID,
- Accuracy (2drms probability).

7.2. Coordinate GNSS antenna position settings:

- Set GNSS antenna locations from amidships and off centreline (Consistent Common Reference Point – CCRP)
- Switch on primary and secondary position sources by assigning ports for NMEA/IEC 61162 data feed

7.3. Select position system:

- Primary Position Sensor
- Secondary Position Sensor
- Auto change (automatic switching to dead reckoning position).

7.4. Determine fix quality (status) of GNSS:

- Position information,
- Alarms and indications of disruptions of GNSS data feed,
- Tracking the discrepancy between Primary Position Sensor and Secondary Position Sensor,
- Monitoring the GNSS data port,
- Check ship's position by a second independent means.

8. Basic navigation (1.0 hr)

The trainee operates many of the basic navigational functions and settings (Refs: T1 ch.6.2; B7).

8.1. Activate display categories and information layers:

- Base, Standard, All and Custom,
- Spot soundings limit (depths $\leq$ safe setting are displayed as bold),

- Channel limits, fairways, landmarks, special areas, warnings,
- Message “Layers Lost” when any are turned off.

8.2. Monitor vessel safety:

- Recognize position, gyro, speed log, COG, SOG, time,
- Set a safe depth value from sea level with regards to Isolated Dangers,
- Set a safe depth contour,
- Identify contours shown in Base Display,
- Identify other Base Display information that cannot be turned off.

8.3. Activate route monitoring features:

- Track, log, drift summary, sensor status, target tracks, scale, route information, contours, isolated dangers, special areas, alarm limits,
- Activate day/night colour sets, track display, scale bar, vessel symbol,
- Set voyage recording (Logbook) track period, precision, colour, history, routing information, filters.

9. Heading & drift vectors (0.5 hr)

The trainee operates basic navigational functions and settings pertaining to ownship's heading vector, course over ground vector, and guard ring (Refs: T1 ch.8.1; R3; R4; B7).

9.1. Activate vessel's motion vectors:

- Turn either or both vectors on or off,
- Alignment of vessel contour,
- Set vector length.

9.2. Obtain vessel's course and speed from the positioning system:

- COG & SOG may be from position system or from ARPA reference,
- HDG is true or undefined (manual entry only when in DR),
- LOG may be bottom, water, ARPA, or position system referenced.

9.3. Interpret the movement of the vessel:

- The graphical difference between the COG/SOG and the HDG/LOG vectors is the drift angle,
- Display of drift angle reveals vessel momentum in a turn,
- Drift angle in steady state reveals sum of wind and current on vessel.

9.4. Recognize the effects of gyro error:

- Drift angle results from gyro data without any provision for correction,
- Gyro precession due to high-speed turns produces an unreliable HDG display on ECDIS.

9.5. Graphically monitor ownship's approach to isolated dangers by means of a guard ring or equivalent ECDIS function

Ex. 1. Simulator exercise – open sea (2.0 hours)

The trainee operates specific functions constituting task groups for route monitoring in an open sea area, and obtains all relevant information for basic safe integrated navigation.

- Demonstrate the following tasks on ECDIS while navigating safely in an open sea setting with non-threatening ARPA targets:
 - Monitor sea area,
 - Use the pre-defined route as set by the instructor,
 - Check position with pre-defined fix,
 - Select pre-defined user layers,
 - Check settings such as vector time, display reset, information layers, alarms, track, sensors, and ownship configurations.
- Check settings such as vector time, display reset, information layers, alarms, track, sensors, and ownship configurations.

Instructor guidelines

- Conduct simulation exercise according to exercise description:
 - Set simulation parameters,
 - Provide trainees with a pre-defined route,
 - Brief and debrief trainees,
 - Assess accomplishment of tasks according to exercise description.

Expected outcomes:

- Familiarize with the use of ECDIS
- Navigate with ECDIS
- Monitor SOG and COG