



SUB-COMMITTEE ON STANDARDS OF
TRAINING AND WATCHKEEPING
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DEVELOPMENT OF GUIDANCE ON TRAINING IN THE USE OF ECDIS

Submitted by the Russian Federation

SUMMARY

<i>Executive summary:</i>	The draft of a Guidance "Training and assessment in the operational use of the electronic charts simulator" (annex) is the recommendation in the use of ECDIS simulators.
<i>Action to be taken:</i>	Paragraph 2
<i>Related document:</i>	STW 30/13 (paragraphs 3 4 and 11.4)

1 Having considered document STW 30/13 (paragraphs 3.4 and 11.4) and taking into account the Guidelines on the Organization and Methods of Work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies (MSC/Circ.816), the Russian Federation submits the following draft Guidance "Training and assessment in the operational use of the electronic charts simulator", annex.

Action requested of the Sub-Committee

2 The Sub-Committee is invited to consider the Guidance "Training and assessment in the operational use of the electronic charts simulator" and include it in Part "B" of STCW Code.

ANNEX

THE DRAFT OF A GUIDANCE TRAINING AND ASSESSMENT IN THE OPERATIONAL USE OF THE ELECTRONIC CHARTS SIMULATOR

1 **Training and assessment in the operational use of the ECDIS shall:** incorporate the use of an ECDIS simulation equipment and conform to standards not inferior to those given in paragraphs 2 to 16 below.

2 **The practical training** of operators shall be undertaken on a simulation equipment meeting the standards given in section A-I/12 of the 1995 STCW Convention.

Demonstrations of practical use of ECDIS equipment shall be undertaken both on a simulator and on live marine ECDIS equipment having direct connection with the instructor through a computer network and having the International Certificate and meeting the national standards. Training exercises shall be undertaken in a real or accelerated time-scale.

Theory factors affecting performance and accuracy

3 An elementary understanding shall be attained of the principles of designing electronic charts (both vector and raster) and of operational use of ECDIS together with a full practical knowledge (both in a vector chart display mode and in raster chart display mode) of the following problems:

- .1 installing, starting and setting up of ECDIS, connecting data sensors; radio-navigation system receiver, satellite navigation system receiver, radar, gyrocompass, log, echo-sounder; accuracy and limitations of these sensors, including effect of measurements errors and DOP factor on the accuracy of the information of ship's position, manoeuvring on the accuracy of course indicators performance, compass error on the accuracy of course indication, shallow water on the accuracy of log performance, log correction on the accuracy of speed calculation, disturbance (sea state) on the accuracy of an echo-sounder performance (for the radar see section B-I/12 of the 1995 STCW Convention);
- .2 limitations of raster electronic charts comparing to vector ones;
- .3 current requirements to ECDIS, adopted by IMO resolution A.817(19) "Performance standards for electronic chart display and information systems (ECDIS)".

Detection of an erroneous information

4 Knowledge of the limitations and their detection is essential for the safety of navigation. A special attention shall be paid to knowledge and ability to reveal the following factors, particularly while sailing in narrows:

- .1 radar data representation on a electronic chart, elimination of discrepancy between the radar image and the electronic chart; possible reference-ellipsoid mismatch of electronic chart, positioning system and available paper chart;
- .2 possible projection discrepancies between an electronic chart and paper one;

- .3 possible scale discrepancies (overscaling and underscaling) in displaying an electronic chart and its original scale;
- .4 ECDIS limitations in raster chart display mode:
 - .1 North-up presentation of raster chart;
 - .2 raster charts scales discrepancies at transition from one raster chart to another;
 - .3 discrepancies of projections of raster maps at transition from one raster chart to another;
 - .4 producing manual updating on raster electronic charts.

PRACTICE

- 5 Installing and starting ECDIS.
- 6 Selection of convenient configuration.

Controlling bodies

- 7 Knowledge and skill shall be attained in control using the following modern manipulators:
 - .1 trackball;
 - .2 keyboard.

Operational use of electronic charts

- 8 Knowledge and skills shall be attained in:
 - .1 selecting an electronic chart manually;
 - .2 scaling;
 - .3 using a daytime or night-time display mode;
 - .4 reading all chart symbols and abbreviations;
 - .5 using different kinds of cursors and electronic bars for obtaining navigational data;
 - .6 viewing area in different directions and returning to the ship's position;
 - .7 finding necessary area using geographical co-ordinates;
 - .8 displaying indispensable data layers appropriate to navigational situation;
 - .9 changing colour of symbols and field of a chart;

- .10 reading a chart legend and information of the paper original;
- .11 using north-up orientation presentation and other kinds of orientation;
- .12 using true and relative motion modes;
- .13 using the converter for processing electronic charts of the official hydrographic offices into ECDIS standard.

Route planning

9 Knowledge and skills shall be attained in:

- .1 loading of the ship's characteristics into ECDIS;
- .2 route planning on a display by means of ECDIS using the graphic editor taking into consideration rhumb-line and great circle sailing:
 - .1 using ECDIS database for obtaining navigational, hydrometeorological and other data;
 - .2 taking into consideration circulation, when it is expressed on chart scale;
 - .3 marking dangerous depths and areas and exhibiting of guarding isolines;
 - .4 marking waypoints with the crossing isolines and critical x-track deviations, as well as by adding, replacing and erasing of waypoints;
 - .5 switching alarm signalling where it is necessary;
- .3 route planning with calculation in the table format:
 - .1 course and speed between waypoints;
 - .2 expected time of arrival to a particular point and total time of sailing on a route;
 - .3 alternative route planning;
 - .4 saving planned routes, loading and unloading or deleting of routes;
 - .5 making a graphic copy of the monitor screen and printing a route;
 - .6 editing the planned route;
 - .7 back-route planning;
 - .8 connecting of several routes.

Switching alarm signalling system

10 Knowledge and skills shall be attained in switching following kinds of the sound and visual alarm signalling system in case of:

- .1 absence of next chart in ECDIS database;
- .2 exceeding x-track limits;
- .3 deviation from planned steering;
- .4 approaching waypoint;
- .5 discrepancy between calculated and actual time of arrival to waypoint;
- .6 crossing guard zone;
- .7 approaching navigational danger;
- .8 approaching dangerous area;
- .9 crossing dangerous isoline;
- .10 approaching other ships;
- .11 watch termination;
- .12 switching timer;
- .13 reference-ellipsoid discrepancy between an electronic chart and an algorithm of co-ordinates calculation in navigational system;
- .14 malfunctioning of positioning system used in ECDIS;
- .15 failure of dead-reckoning;
- .16 inability to fix vessel's position using navigational system.

Route sailing

11 Knowledge and skills shall be attained in:

- .1 using independent of ECDIS data to control ship's position or using alternative system in ECDIS;
- .2 proper use of viewing electronic chart function in direction of ship's motion;
- .3 predicting the ship's position for some time interval;
- .4 changing the route planning;

- .5 entering independent of ECDIS data for the calculating wind drift and current allowance;
- .6 reacting properly to the alarm;
- .7 entering corrections for discrepancies of the geodesic datum;
- .8 displaying time markers on a ship's route;
- .9 entering manually ship's position;
- .10 measuring co-ordinates, course and bearings and distances on a chart.

Manual correction of a ship's position and motion parameters

- 12 Knowledge and skills shall be attained in:
- .1 correcting manually ship's position in dead-reckoning mode, when the radio-navigation system receiver is switched off;
 - .2 correcting manually ship's position, when automatically obtained co-ordinates are inaccurate;
 - .3 correcting manually course and speed values.

Navigational calculations

- 13 Knowledge and skills shall be attained in calculating of:
- .1 true wind, speed and parameters of the current;
 - .2 expected time of arrival and speed;
 - .3 height of tides.

Records in the ship's log

- 14 Knowledge and skills shall be attained in:
- .1 viewing records in the electronic ship's log;
 - .2 instant recording in the ship's log;
 - .3 changing ship's time;
 - .4 entering the additional data;
 - .5 printing of the logbook content;
 - .6 viewing track's archive;
 - .7 setting up the automatic record time intervals.

Chart updating

15 Knowledge and skills shall be attained in:

- .1 performing manual updating of electronic charts. Special attention should be paid to reference-ellipsoid conformity and to conformity of measurements units used on a chart and in the correction text;
- .2 performing semi-automatic updating of electronic charts using the data obtained on a diskette in the electronic chart format;
- .3 performing automatic updating of electronic charts, obtained via modern communication lines.

Operational use of ECDIS with ARPA connected

16 Knowledge and skills shall be attained in:

- .1 connecting ARPA to ECDIS;
 - .2 indicating of target's speed vectors;
 - .3 indicating target's tracks;
 - .4 archiving target's tracks;
 - .5 viewing the table of the targets;
 - .6 simulating the manoeuvre;
 - .7 corrections of a ship's position using a reference point captured by ARPA;
 - .8 corrections using the ARPA's cursor and electronic bar.
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