

Draft Consolidated ECDIS-related IMO Circulars

Synopsis of existing guidance

Prepared by Australia (October 2012)

1. DESIGN AND LAYOUT

1.1 MSC/Circ.982: GUIDELINES ON ERGONOMIC CRITERIA FOR BRIDGE EQUIPMENT AND LAYOUT

A successful ergonomic design of the bridge and the bridge equipment will improve the reliability and efficiency of navigation. IMO MSC.1/Circ.982 provides guidelines on the ergonomic requirements for the bridge equipment and layout in order to render assistance to enable consistent, reliable and efficient bridge operation.

These guidelines are intended to apply to new ships and will assist for the appropriate design and installation of ECDIS equipment on board. In accordance with this Circular, the Electronic Chart Display and Information System (ECDIS) is considered as one of the important element for the following workstations:

- Workstation for navigating and manoeuvring
- Workstation for planning and documentation

Comment: In Appendix 2 of this circular, ECDIS should be included in the list of proposed equipment for “Workstation for monitoring”.

1.2 SN.1/Circ.265: GUIDELINES ON THE APPLICATION OF SOLAS REGULATION V/15 TO INS, IBS AND BRIDGE DESIGN

SOLAS regulation V/15 requires that the design and arrangement of navigation systems and equipment on the bridge facilitate the tasks to be performed by

the bridge team and the pilot and promote safe and effective Bridge Resource Management (BRM).

IMO SN.1/Circ.265 identifies the needs of the bridge team and the pilot and the BRM principles that should be taken into account in the design and arrangement of Integrated Navigation Systems (INS), Integrated Bridge Systems (IBS) and for bridge design for the installation of INS and IBS on the bridge. The use of ECDIS on board ships can perform some of critical navigational tasks in accordance with the IMO performance standards of INS and IBS. Hence, for the bridge design and installation of ECDIS on board ships reference should be made to this circular.

2. HARDWARE

2.1 MSC.1/Circ.1221: VALIDITY OF TYPE APPROVAL CERTIFICATION FOR MARINE PRODUCTS

MSC.1/Circ.1221 outlines that the type approval certification scheme used by flag States, classification societies and other recognized bodies should include the following steps:

- .1 engineering evaluation;
- .2 witnessing the manufacturing and testing processes;
- .3 evaluating the manufacturing arrangements; and
- .4 issuing of a Type Approval Certificate generally valid for not more than 5 years which may be subject to annual inspections or verification of the manufacturer's process after all the above-mentioned procedures have been satisfactorily completed.

In accordance with MSC.1/Circ.1221, the validity of the Type Approval Certificate itself has no influence on the operational validity of a product accepted and installed on board a ship. Vitally, a product manufactured during the period of validity of the relevant Type Approval Certificate need not be renewed or replaced due to expiration of such Type Approval Certificate.

Comment:

The “marine product” as mentioned in this Circular should be differentiated between “hardware” and “software” component.

This circular should recognise that within the validity of the type approval period there should be a need for the renewal, update or replacement of the software for ECDIS.

2.2 MSC.1/Circ.1389: GUIDANCE ON PROCEDURES FOR UPDATING SHIPBORNE NAVIGATION AND COMMUNICATION EQUIPMENT

As navigation and radiocommunication equipment becomes increasingly software and firmware dependent, updates to application software and firmware to meet changes in IMO and ITU regulatory requirements are needed. Adequate navigation and radiocommunication equipment software and firmware maintenance arrangements should be implemented by shipowners and be supported by equipment manufacturers. Equipment should provide the means to display, on demand, the current applicable software and firmware versions.

Equipment manufacturers should provide timely access to information pertaining to maritime navigation and radiocommunication equipment application software, for any relevant changes, originating from IMO and ITU regulations. This could, for example, be by website listing relevant regulations currently in effect for the equipment, equipment software and firmware versions, compliance status and regulatory type approvals for the listed configurations/versions. Update of operating systems and hardware may also be necessary to meet the changed requirements.

Shipowners should ensure that the vessel's equipment is up to date with the latest requirements. In addition to the above, in the case of ECDIS reference should be made to SN.1/Circ.266/Rev.1 as may be amended.

3. SOFTWARE

3.1 SN.1/Circ.266/Rev.1: MAINTENANCE OF ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM (ECDIS) SOFTWARE

ECDIS in operation comprises of three ‘elements’ - hardware, software and data. It is vital that the application software works fully in accordance with the

performance standards and is capable of displaying all the relevant digital information contained within the Electronic Navigational Chart (ENC).

ECDIS that is not updated for the latest version of IHO standards may not meet the chart carriage requirements as set out in SOLAS regulation V/19.2.1.4.

Any ECDIS which has not been upgraded to the latest version of the **Product Specification** or the S-52 Presentation Library may be unable to correctly display the latest charted features. Additionally, the appropriate alarms and indications may not be activated even though the features have been included in the ENC. Similarly, any ECDIS which is not updated to be fully compliant with the S-63 Data Protection Standard may fail to decrypt or to properly authenticate some ENCs, leading to failure to load or install.

The latest IHO standards (last update: 12 October 2011) that apply to ECDIS equipment is given below:

<i>Last update: 12 October 2011</i>	
Latest IHO Standards that apply to ECDIS Equipment	
Edition in force	Title
S-57 Edition 3.1 (November 2000)	Transfer Standard for Digital Hydrographic Data
S-52 Edition 6.0 (March 2010)	Chart Content and Display Aspects of ECDIS
PresLib Edition 3.4 (Annex A to S-52 - January 2008)	Presentation Library for ECDIS
S-63 Edition 1.1 (March 2008)	Data Protection scheme
S-64 Edition 1.1 (December 2008)	Test Data Sets for ECDIS
S-61 Edition 1.0 (January 1999)	Product Specification for Raster Navigational Chart (RNC) <i>(only if ECDIS software supports RCDS mode)</i>

The need for safe navigation requires that manufacturers should provide a mechanism to ensure software maintenance arrangements are adequate. This may be achieved through the provision of software version information using a website. Such information should include the IHO standards which have been implemented. Administrations should inform shipowners and operators that proper ECDIS software maintenance is an important issue and that adequate

measures need to be implemented by masters, shipowners and operators in accordance with the International Safety Management (ISM) Code.

Comment:

This circular needs to be updated with the latest status of the applicable IHO standards that apply to ECDIS equipment.

It is suggested that a direct link to the IHO website that lists the latest IHO standards applicable to ECDIS equipment be provided in this circular (e.g. http://www.iho.int/mtg_docs/enc/ECDIS-ENC_StdsIn_Force.htm).

3.2 MSC.1/Circ.1391: OPERATING ANOMALIES IDENTIFIED WITHIN ECDIS

Comment: The content of this circular (in particular paragraph 3) should be transferred to SN.1/Circ.312. The circular can then be withdrawn.

3.3 SN.1/Circ.312: OPERATING ANOMALIES IDENTIFIED WITHIN ECDIS

This latest circular provides guidance or information that becomes available on operating anomalies identified with ECDIS to supplement the guidance in MSC.1/Circ.1391 (above).

4. ELECTRONIC CHARTS

4.1 SN.1/Circ.276: TRANSITIONING FROM PAPER CHART TO ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEMS (ECDIS) NAVIGATION

IHO catalogue of chart coverage

The International Hydrographic Organization (IHO) provides an online chart catalogue that details the coverage of Electronic Navigational Charts (ENC) and Raster Navigational Charts (RNC) (where they exist and where there is not yet ENC coverage) together with references to coastal State guidance on any requirements for paper charts (where this has been provided). The catalogue also provides links to IHO Member States' websites where additional information may be found. The IHO online chart catalogue can be accessed from the IHO website at: www.iho.int.

Comment:

This Circular makes reference to IHO website for ENC chart catalogue and the requirement for paper charts by the coastal states. However, the requirement for back-up and/or appropriate folio of paper charts remain ambiguous with the existing text/heading as provided on the IHO website. In particular, the difference between the back-up paper charts and the appropriate folio of paper charts (to be used in the RCDS mode) is not clearly reflected on the IHO website.

4.2 SN.1/Circ.213: GUIDANCE ON CHART DATUMS AND THE ACCURACY OF POSITIONS ON CHARTS

Comment:

This IMO Circular does not contain direct references to ENC on the subject matter. A proposed revision of the Circular with one additional paragraph (along the line of suggested text and diagram) may need to be considered:

“Unlike paper charts, the quality of bathymetric data contained in an ENC is not readily apparent. The symbology used for providing information relating to the hydrographic survey is not particularly intuitive for the user. The user is only able to derive the information about chart data quality when the ‘Display Category’ is set to ‘All’, thereby cluttering the view. The table below provides information relating to the survey characteristics of ENC.”

ID	CATZOC	Symbol	Typical Survey Characteristics*
1	A1		Controlled systematic high accuracy Survey on WGS 84 datum; using DGPS or a minimum three lines of position (LOP) with multi-beam, channel or mechanical sweep system.
2	A2		Controlled systematic survey to standard accuracy; using modern survey echo sounder with sonar or mechanical sweep.
3	B		Controlled systematic survey to standard accuracy.
4	C		Low accuracy survey or data collected on an opportunity basis such as soundings on passage.
5	D		Poor quality data or data that cannot be quality assessed due to lack of information.
6	U		Source information has not been assessed for quality by the ENC producer

4.3 SN.1/Circ.255: ADDITIONAL GUIDANCE ON CHART DATUMS AND THE ACCURACY OF POSITIONS ON CHARTS

In some areas of the world, there are charts that are based on old surveys for which there is no determined geodetic datum (or for which the datum is imprecise). Therefore, in such areas, paper charts (and therefore RNCs) are not compatible with GNSS navigation, and it will take some time to resolve this problem. This makes it extremely difficult to accurately plot the ship's position obtained by the GNSS in relation to surrounding dangers on such charts. The difference in the plotted position can often be significant and could lead to an incident or increased risk in restricted waters.

Cross-checking of position using visual or radar fixing or ECDIS radar overlay can provide for the immediate detection of datum inconsistencies in electronic charts, and immediately alert the mariner on potential positional shifts required for particular charts. Some ECDIS equipment exceeds the minimum requirements of the ECDIS Performance standards, by providing such features as radar overlay.

5. OPERATIONAL

5.1 SN.1/Circ.207/Rev.1: DIFFERENCES BETWEEN RCDS AND ECDIS

ECDIS has the ability to operate in two modes:

1. the ECDIS mode, when Electronic Navigational Charts (ENCs) are used; and
2. the RCDS mode, when ENCs are not available (and Raster Navigational Charts (RNCs) are used instead).

However, the RCDS mode does not have the full functionality of ECDIS, and can only be used together with an appropriate portfolio of up-to-date paper charts. The mariners' attention is therefore drawn to a list of limitations of the RCDS mode.

5.2 SN.1/Circ.274: GUIDELINES FOR APPLICATION OF THE MODULAR CONCEPT TO PERFORMANCE STANDARDS

Comment:

This Circular relates to the IMO ECDIS performance standards. The application of modular concept (as outlined in this circular) may need to be considered to resolve some of the issues arising from the discrepancies between the two existing performance standards of ECDIS. For example, ECDIS units complying with the older performance standards A.817 (19) are not required to give any indication or alarm when unofficial charts are being used.

6. TRAINING AND ASSESSMENT

6.1 SN.1/Circ.276: GUIDANCE ON TRANSITIONING FROM PAPER CHART TO ECDIS NAVIGATION

Transition and training

Shipowners and operators should undertake an assessment of the issues involved in changing from paper chart to ECDIS navigation. Ships' crews should participate in any such assessment so as to capture any practical concerns or needs of those that would be required to use ECDIS. Such a process will help facilitate an early understanding of any issues to be addressed and will aid ships' crews prepare for change.

Documenting the assessment of issues, combined with the development of ECDIS standard operating procedures, will help lead to the adoption of robust ECDIS navigation practices, simplification of crew training and facilitate smooth handovers between crews.

In addition, shipowners and operators should ensure that their ships' crews are provided with a **comprehensive familiarization programme** and **type-specific training**; and that the ships' crew fully understand that the use of electronic charts aboard ship continues to require the need for passage planning.

Comment:

Under "transition and training", the title for ECDIS training should be amended as follows:

- Generic ECDIS training – in lieu of Comprehensive familiarization programme
- Familiarisation training – in lieu of type-specific training

6.2 STCW.7/Circ.10: INTERIM GUIDANCE ON TRAINING AND ASSESSMENT IN THE OPERATIONAL USE OF THE ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM (ECDIS) SIMULATORS

Comment:

The content of this Circular can remain as is. However, suggest consider changing the status of this Circular as in its current state, it is merely an “interim” guidance.

6.3 IMO STCW.7/Circ.18: ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEMS TRAINING

Comment:

The wording in sub-paragraphs 7 and 8 could be misleading. It is a common misconception that there is no requirement for ECDIS training for masters and officers serving on ECDIS-fitted ships under the existing STCW 95 Convention. Also, it is commonly assumed that the requirement for training in accordance with the 2010 Manila amendments becomes effective 1 Jan 2017. Both assumptions are incorrect. The following aims to clarify this issue.

Under the provisions of Standards of Training, Certification and WatchKeeping for Seafarers (STCW) Convention (STCW 95), there has been requirement for all officers who carry out navigational tasks to be appropriately trained. All officers in charge of a navigational watch on ships of 500 gross tonnage or more must have a thorough knowledge of and ability to use nautical charts and nautical publications (ref STCW Code Table A-II/1). The definition of a nautical chart as provided in SOLAS Chapter V Regulation 2 includes a special-purpose map or book, or “a specially compiled database”. This clearly includes Electronic Navigational Charts (ENCs) and Raster Navigation Charts (RNCs), and hence includes the use of ECDIS. Therefore, there is a clear requirement for ECDIS training in accordance with the existing STCW 95 Convention.

It should be noted that training in accordance with STCW 95 may be accepted until 30 June 2013, and Certificate of Competency (CoC) issued under STCW 95 can be valid until 1 January 2017. This is due to the fact that training as per the Manila Amendments 2010 to STWC 95 becomes effective 1 July 2013 and any CoC with expiry dates beyond 1 Jan 2017 must comply with the 2010 Manila

Amendments to the STCW Convention. The 2010 Manila Amendments to the STCW Convention and Code have introduced several additional specific competencies in the use of ECDIS for masters and officers in charge of a navigational watch serving on ECDIS-fitted ships.

The requirement for ECDIS familiarisation is recognised under the provisions of sections 6.3 and 6.5 of the International Safety Management (ISM) code. However, the requirement for ECDIS familiarisation is for training only and it does not contain any requirement for possessing an ECDIS training certificate.

6.4 SN.1/Circ.243: GUIDELINES FOR THE PRESENTATION OF NAVIGATION-RELATED SYMBOLS, TERMS AND ABBREVIATIONS

Comment:

This is a 16-page Circular which can be included as an annex to the proposed main document. Suggest inclusion of the ENC Symbols and abbreviations in this Circular. Reference could be drawn from “Admiralty quick guide to ENC symbols”.
