標題

AMSA 発行 "Guidance on ECDIS for ships calling at Australian ports"に関する注意喚起（改正）

ClassNK
テクニカル
インフォメーション

No. TEC-1067
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各位

Australian Maritime Safety Authority (AMSA)は、ECDIS に関して Marine Notice 11/2012 を発行しておりましたが、これに換えて Marine Notice 8/2016 を発行しました。
これにより、2012 年 8 月 24 日付発行の ClassNK テクニカル・インフォメーション No. TEC-0924 を絶版と致します。

同 Notice には Port State Control Inspections における ECDIS 関連の検査項目を 12 項目示しており、その中には"demonstration of operational competency by the ship's navigating officer (e.g. safety checking of a voyage plan)"等、船上での実際の設定、操作および保守点検が含まれています。

詳細につきましては、添付をご参照下さい。これらは下記の AMSA ウェブサイトから取得可能です。
https://apps.amsa.gov.au/MOReview/MarineNoticeExternal.html

なお、本件に関してご不明な点は、以下の部署にお問い合わせください。

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添付:

1. Marine Notice 8/2016
2. ECDIS flow charts and Frequently Asked Questions

NOTES:

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Australian Government
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MARINE NOTICE

Marine Notice 8/2016
Supercedes 11/2012

Guidance on ECDIS for ships calling at Australian ports

The phased carriage requirement of Electronic Chart Display and Information System (ECDIS) is underway and is scheduled to be completed by 2018.

Comprehensive guidance is available in the International Maritime Organization (IMO) Circular MSC.1/Circ.1503 *ECDIS Guidance for Good Practice.* All ships masters, navigating officers and operators of ships fitted with ECDIS are encouraged to use this guidance to facilitate the safe and effective use of ECDIS.

This Marine Notice highlights areas relevant to the safe and proper operation of ECDIS for ships visiting Australian ports. It also provides information on AMSA's expectations for ECDIS compliance during port State control (PSC) Inspections.

Software Quality Assurance

Ship owners and operators need to ensure careful management and regular maintenance of both ECDIS hardware and software. MSC.1/Circ.1503 contains guidance on maintenance of ECDIS software and identifies the need to keep ECDIS updated to meet the current International Hydrographic Organization (IHO) standards.

The IHO published new editions of the S-52, S-63, and S-64 standards in August 2015. The following IHO standards apply to all newly installed ECDIS equipment:

- Edition 6.1 of Publication S-52 – Specification for Chart Content and Display Aspects of ECDIS
- Edition 4.0 of S-52 Annex A - IHO Presentation Library for ECDIS
- Edition 1.2.0 of Publication S-63 – IHO Electronic Navigational Chart (ENC) Data Protection Scheme
- Edition 3.0 of Publication S-64 – IHO Test Data Sets for ECDIS.

The current editions of these standards remain valid until 31 August 2017, at which time the previous versions will no longer display the appropriate presentation library. To display the latest approved presentation library, existing ECDIS systems will require upgrading or in some cases replacing before 31 August 2017.

Anomalies

A list of known ECDIS anomalies is included in MSC.1/Circ.1503. Due to the complex nature of ECDIS, and because it involves a mix of hardware, software and data, it is possible (but considered not likely) that further undetected anomalies may exist. The existence of anomalies highlights the importance of maintaining ECDIS software to ensure the correct display of up-to-date electronic navigational charts.

To help understand the extent of these anomalies, navigating officers are encouraged to report any such anomalies, including specific details regarding fitted equipment, to their flag State authority.

ECDIS Data Presentation and Performance Check dataset

The IHO has produced an ECDIS Data Presentation and Performance Check dataset that allows mariners to check some important aspects of the operation of their ECDIS. This dataset contains two fictitious ENC cells which can be loaded into an ECDIS to assess operating performance. The test will check whether there are any display anomalies that need to be remedied or otherwise managed. If the check highlights a problem, guidance notes in the check dataset offer suggested courses of action.

Chart Carriage Requirements

The International Convention for the Safety of Life at Sea (SOLAS) Chapter V Regulation 27 states that all nautical charts necessary for the intended voyage shall be adequate and up to date. For ships using ECDIS to meet the chart carriage requirement of SOLAS, all ENCs (and any RNCs) must be of the latest available edition and be kept up to date using both the electronic chart updates (e.g. ENC updates) and the latest available notices to mariners.

Mode of ECDIS operation

ECDIS may be operated in one of two modes:

1. ECDIS mode when ENC's are used;
or
2. Raster Chart Display System (RCDS) mode, when suitable ENC's are not available and Raster Navigational Chart's (RNC) are used instead.

RCDS mode does not have the same functionality as ECDIS mode and can only be used together with an appropriate folio of up to date paper charts. MSC.1/Circ.1503 provides guidance on the limitations and dangers of operating ECDIS in RCDS mode.

All Australian waters are covered by ENCs and therefore ECDIS should not need to be operated in RCDS mode. Where lack of ENC coverage requires navigation in RCDS mode, mariners should critically consider the implications of not having a look-ahead capability.

ECDIS training requirements

The International Convention on the Standards of Training, Certification and Watchkeeping for Seafarers (STCW), requires all officers who carry out navigational tasks to be appropriately trained. All officers in charge of a navigational watch must have a thorough knowledge of and ability to use nautical charts and nautical publications (see STCW Code Table A-II/1). The definition of a nautical chart in SOLAS V/2 includes a special-purpose map or book, or "a specially compiled database". This includes ENCs and RNCs, relating to the use of ECDIS. All masters and officers in charge of a navigational watch on ECDIS-fitted ships who commenced an approved education and training program before 1 July 2013 will need to have undertaken approved ECDIS training.

Port State Control inspections

AMSA's PSC Inspectors focus on how ships meet the SOLAS requirements for chart carriage and the safe and effective conduct of navigation tasks. PSC Inspectors will take account of ECDIS-related issues including:

- appropriate declaration of ECDIS equipment in the Record of Equipment – Safety Equipment Certificate
- listing of ECDIS as critical equipment in the Safety Management System (SMS)
- documented procedures and instructions for the use of ECDIS are included in the SMS and that they are understood by all officers responsible for navigation
- ECDIS type approval certificate, confirming compliance with relevant IMO performance standard and the International Electrotechnical Commission (IEC) test standard
- ECDIS software is maintained to the latest applicable IHO standards
- use of latest edition official ENCs, updated and corrected to the latest available updates and notices to mariners
- adequate independent back-up arrangements (as detailed on the Record of Equipment), ensuring safe navigation for the remainder of the voyage in the event of an ECDIS failure

- approved ECDIS generic and familiarisation training has been undertaken by the master and officers in charge of a navigational watch
- conformance and alignment with input from sensors (e.g. heading, speed and rate of turn) and presentation of such information on the ECDIS display
- evidence of periodic tests and checks of the ECDIS carried out in accordance with the SMS and manufacturer's requirements
- demonstration of operational competency by the ship's navigating officers (e.g. safety checking of a voyage plan)
- ECDIS settings are appropriate to the ship's dimensions and area of operations (e.g. cross track error, anti-grounding cone, safety depth and contour).

ECDIS flow charts and Frequently Asked Questions (FAQ's)

A set of ECDIS flow charts and FAQ's are available on AMSA's website. The flow charts assist PSC inspectors in assessing the carriage requirement and use of ECDIS on board. PSC Inspectors consider all relevant circumstances, including steps taken to reduce risk and improve safety, when assessing ECDIS deficiencies and appropriate remedial actions.

AMSA's FAQs on ECDIS provides information on regulatory matters, charting, software and training.

Availability of related information

- General information and FAQs on ECDIS: http://www.amsa.gov.au/navigation/resources/ecdis/
- IHO check dataset and instructions: https://www.iho.int/srv1/index.php?option=com_content&view=article&id=585:news&catid=166:1news-links&Itemid=287&lang=en
- IMO Circular MSC.1/Circ.1503:

Download from www.imo.org

1. Click on 'Our Work'
2. Click on 'Circulars'
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Gary Prosser
Deputy Chief Executive Officer
April 2016

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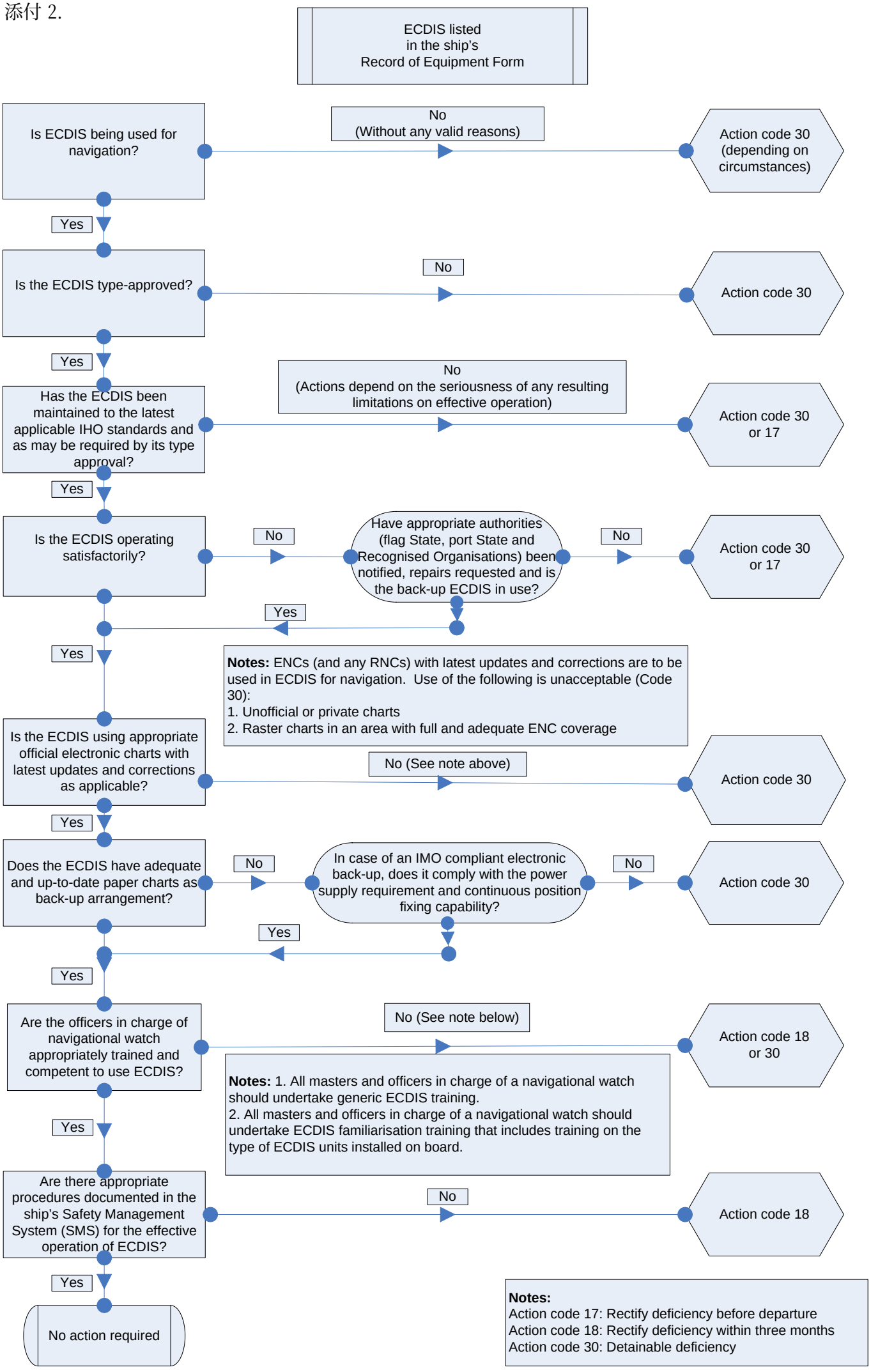
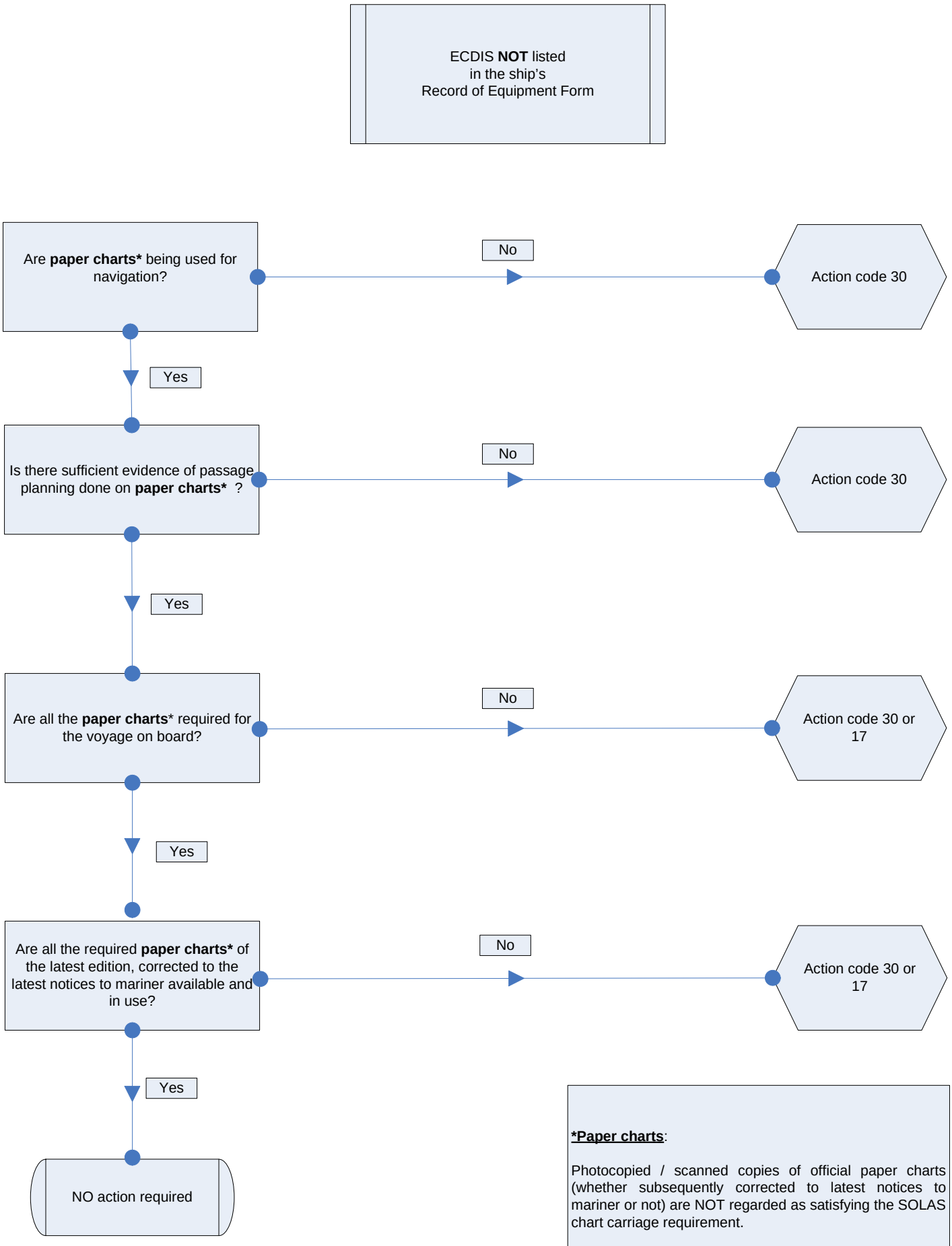
File: 2016/1570


ECDIS listed in the ship's Record of Equipment Form
Is ECDIS being used for navigation?
No (Without any valid reasons)
Action code 30 (depending on circumstances)
Yes
Is the ECDIS type-approved?
No
Action code 30
Yes
Has the ECDIS been maintained to the latest applicable IHO standards and as may be required by its type approval?
No (Actions depend on the seriousness of any resulting limitations on effective operation)
Action code 30 or 17
Yes
Is the ECDIS operating satisfactorily?
No
Have appropriate authorities (flag State, port State and Recognised Organisations) been notified, repairs requested and is the back-up ECDIS in use?
No
Action code 30 or 17
Yes
Yes
Notes: ENCs (and any RNCs) with latest updates and corrections are to be used in ECDIS for navigation. Use of the following is unacceptable (Code 30):
1. Unofficial or private charts
2. Raster charts in an area with full and adequate ENC coverage
Is the ECDIS using appropriate official electronic charts with latest updates and corrections as applicable?
No (See note above)
Action code 30
Yes
Does the ECDIS have adequate and up-to-date paper charts as back-up arrangement?
No
In case of an IMO compliant electronic back-up, does it comply with the power supply requirement and continuous position fixing capability?
No
Action code 30
Yes
Yes
Are the officers in charge of navigational watch appropriately trained and competent to use ECDIS?
No (See note below)
Action code 18 or 30
Notes: 1. All masters and officers in charge of a navigational watch should undertake generic ECDIS training.
2. All masters and officers in charge of a navigational watch should undertake ECDIS familiarisation training that includes training on the type of ECDIS units installed on board.
Yes
Are there appropriate procedures documented in the ship's Safety Management System (SMS) for the effective operation of ECDIS?
No
Action code 18
Yes
No action required
Notes:
Action code 17: Rectify deficiency before departure
Action code 18: Rectify deficiency within three months
Action code 30: Detainable deficiency



***Paper charts**:

Photocopied / scanned copies of official paper charts (whether subsequently corrected to latest notices to mariner or not) are NOT regarded as satisfying the SOLAS chart carriage requirement.

Notes:
Action code 17: Rectify deficiency before departure
Action code 30: Detainable deficiency

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Electronic Chart Display and Information System (ECDIS)

Frequently asked questions

REGULATORY

1. When will the carriage of ECDIS be mandatory?

The mandatory carriage of ECDIS depends on ship type, size and construction date. The IMO Resolution MSC.282(86) has amended SOLAS Reg V/19 to include a new paragraph 2.10 detailing a carriage requirement of ECDIS on certain kinds of ships engaged on international voyages. In accordance with this regulation, certain kinds of ships engaged on international voyages shall be fitted with an Electronic Chart Display and Information System (ECDIS) as follows:

1. passenger ships of 500 gross tonnage and upwards constructed on or after 1 July 2012;
2. tankers of 3,000 gross tonnage and upwards constructed on or after 1 July 2012;
3. cargo ships, other than tankers, of 10,000 gross tonnage and upwards constructed on or after 1 July 2013;
4. cargo ships, other than tankers, of 3,000 gross tonnage and upwards but less than 10,000 gross tonnage constructed on or after 1 July 2014;
5. passenger ships of 500 gross tonnage and upwards constructed before 1 July 2012, not later than the first survey[1] on or after 1 July 2014;
6. tankers of 3,000 gross tonnage and upwards constructed before 1 July 2012, not later than the first survey on or after 1 July 2015;
7. cargo ships, other than tankers, of 50,000 gross tonnage and upwards constructed before 1 July 2013, not later than the first survey on or after 1 July 2016;
8. cargo ships, other than tankers, of 20,000 gross tonnage and upwards but less than 50,000 gross tonnage constructed before 1 July 2013, not later than the first survey on or after 1 July 2017; and
9. cargo ships, other than tankers, of 10,000 gross tonnage and upwards but less than 20,000 gross tonnage constructed before 1 July 2013, not later than the first survey on or after 1 July 2018.

2.11 Administrations may exempt ships from the application of the requirements of paragraph 2.10 when such ships will be taken permanently out of service within two years after the implementation date specified in subparagraphs .5 to .9 of paragraph 2.10.

2. For which ships will the Port State Control guidance as referred to in AMSA Marine Notice 11/2012 be applicable?

AMSA Marine Notice 11/2012 provides guidance for all ships that adopt to use ECDIS voluntarily or in accordance with SOLAS Reg V/19.2.10.

3. What declaration needs to be made on a ship's Safety Certificates under SOLAS for using ECDIS as a means of navigation?

Details of a ship's navigational systems and equipment are recorded in the "Record of Equipment" attached to several safety certificates under SOLAS including:

- Passenger Ship Safety Certificate - Form P
- Cargo Ship Safety Equipment Certificate - Form E
- Cargo Ship Safety Certificate - Form C

The means of complying with SOLAS Chapter V Regulation 19 needs to be indicated (i.e. paper charts and/or ECDIS) in the relevant "Record of Equipment". If a ship uses ECDIS for navigation, the "Record of Equipment" must clearly state the back-up arrangement in place.

Declaring ECDIS in the ship's "Record of Equipment" makes ECDIS a surveyable item under SOLAS regulations. Therefore, by stating "ECDIS fitted" in the relevant form (even though the carriage of ECDIS may not yet be mandatory), it is taken that the ship is using ECDIS as one of the means of complying with SOLAS Reg V/19. In such a case, ECDIS equipment on board must be in compliance with the IMO's performance standards for ECDIS, as appropriate.

If a ship requires flexibility in using either paper charts or ECDIS as the means of navigation (and this is permissible for the ship in question in relation to SOLAS Reg V/19), such an arrangement must be clearly indicated by including both in the ship's "Record of Equipment". In such cases, both paper charts and ECDIS must comply with SOLAS requirements.

If ECDIS is carried on board as a training aid, an official letter from the flag administration or from the relevant marine Classification Society should be provided to confirm this. Where ECDIS units are installed on board as a training aid, they should be appropriately marked ("for training purpose only") and must not be used for navigation. In such cases, ECDIS must not be listed in the ship's "Record of Equipment".

[1]Refer to the unified interpretation of the term "first survey" referred to in SOLAS regulations (MSC.1/Circ.1290).

4. Will AMSA accept ECDIS units that comply with the older ECDIS performance standards A.817(19))?

The older performance standards (PS) for ECDIS as outlined in IMO Resolution A.817(19) has been revised and updated. As a result, depending on the date of installation, ECDIS units are required to comply with one of the two IMO PSs (A.817(19) or MSC.232(82)), as indicated below:

- ECDIS equipment installed after 1st January 2009 must comply with the current revised PS for ECDIS (IMO Resolution MSC.232(82)).
- ECDIS equipment installed after 1st January 1996 but before 1st January 2009 can comply with the older PS for ECDIS (IMO Resolution A.817(19)).

ECDIS equipment installed before 1st January 1996 may not comply with any of the above IMO PSs and may not be considered an IMO-compliant ECDIS.

For the older ECDIS PS to be acceptable, the ship must have clear evidence of the date of installation of the ECDIS.

5. What is the requirement for back-up arrangements of ECDIS for Australian flagged ships?

The IMO performance standards for ECDIS require that adequate back-up arrangements should be provided to ensure safe navigation, in case of an ECDIS failure. The principal functional requirements for back-up are: to enable a safe take over of the ECDIS functions (to ensure that an ECDIS failure does not develop into a critical situation), and to provide means of safe navigation for the remaining part of the voyage in case of an ECDIS failure.

Appendix 6 of the IMO PSs list the functional requirements of the back-up system but does not prescribe specific arrangements that can meet these requirements.

For Australian flagged ships, AMSA considers the following will meet the back-up requirements for ECDIS:

Option 1: A second 'compliant' ECDIS which must be independent of the main ECDIS and connected to the ship's main power supply, emergency power supply (refer SOLAS Regulation Chapter II-I). It must also be connected to systems providing continuous position fixing capability. The back-up ECDIS must have the chart database and voyage plan loaded before commencement of the voyage. In confined waters the back-up arrangements must be in operational mode.

Option 2: A folio of paper charts that satisfies SOLAS carriage requirements, corrected to the latest available Notices to Mariners, covering the intended voyage and showing the intended voyage plan.

Therefore, and depending on the application of SOLAS Reg V/19 to the ship in question at the time, an Australian flagged ship can carry nautical charts in accordance with the following options:

- Paper charts
- Two independent IMO compliant ECDIS units
- One IMO compliant ECDIS unit and one set of paper charts

Note that depending on the ship type, size and construction date, the "paper charts" option alone will not be acceptable after the mandatory carriage requirement date as specified in SOLAS Reg V/19.

6. What is the requirement for back-up arrangement of ECDIS for non-Australian flagged ships?

Non-Australian flagged ships should comply with SOLAS and their flag State requirements.

CHARTS

7. What type of charts can be used in areas not adequately covered by Electronic Navigational Charts (ENC)? Does AMSA permit the use of Raster Navigational Charts (RNC) on board?

Although the primary mode of operation of ECDIS requires the use of ENCs, under certain circumstances the ECDIS performance standards (PS) allow the use of Raster Navigational Chart (RNC). Section 1.9 of the ECDIS PSs state that: *When the relevant chart information is not available in the appropriate form (see section 4), some ECDIS equipment may operate in the Raster Chart Display System (RCDS) mode as defined in appendix 7.*

Large scale ENC coverage of the world's busiest 800 ports as well as coverage of connecting shipping routes is now more than 94% complete[2]. However, away from major shipping routes, ENCs may be limited to small scale coverage only. In such areas, some ECDIS equipment may not activate alarms for some features/hazards in some display configurations. These features/hazards could be difficult to detect on ECDIS as they may be obscured by other detail (such as contour labels). This is most likely to be a problem where only small scale ENCs (usage band

[2]Evaluation of availability of Electronic Navigational Charts (NAV 57/6/1) submitted by the International Hydrographic organisation (IHO).

1 and 2) are available. When planning a passage in such areas, mariners should note:

- Any cautions embedded in an ENC advising the need to refer to larger scale charts, and
- Any areas within an ENC showing nil/inadequate data within that scale band

Noting the above, in areas covered only by small scale ENCs and where navigation hazards might be expected AMSA recommends reference be made to either larger scale RNCs or the equivalent paper charts to obtain greater detail of information. Where any significant area needs to be navigated using ECDIS in RCDS mode, mariners should critically consider the ability of their ECDIS to provide an adequate 'look ahead' capability and to make use of manually inserted caution and warning areas. In all cases, when referring to RNC and appropriate paper charts, these charts should be kept up to date.

8. Does AMSA allow the use of scanned copies of official paper charts?

Photocopied or scanned copies of official paper charts, whether subsequently corrected to latest notices to mariner or not, are not regarded as satisfying the SOLAS chart carriage requirement.

9. What is a possible course of action if inaccuracies in electronic charts produced by commercial chart producers are observed?

Although most of the electronic charts created by commercial chart producers, also known as private charts, appear to be vector charts with all the features of ENCs, they are not recognised as 'official charts'. This is because they are not issued under the authority of a national hydrogrpahic office or similar institution. Hence, private charts produced by commercial chart producers should not be used for navigation since they do not meet the SOLAS chart carriage requirement.

Official vector charts (known as Electronic Navigational Charts or ENC) are produced by or on the authority of national hydrographic offices. The ENC chart database is standardised with respect to its content, structure and format for use within ECDIS. ENCs are compiled in accordance with International Hydrographic Organization (IHO) standards, such as S-57 (chart data transfer standard) and S-52 (product display specification). Moreover, all ENCs are regularly updated with official updates.

AMSA plays no role concerning inaccuracies found in unofficial charts. It is the responsibility of ship operators to ensure that electronic charts used on board are official and up to date. Any observed inaccuracies in private charts should be brought to the attention of the supplier.

SOFTWARE

10. Does AMSA allow ships installed with ECDIS complying with older performance standards (A.817(19)) and conforming to IMO SN Circ.266/Rev.1 to freely enter/depart Australian ports?

This will generally be acceptable by AMSA provided the relevant software for the ECDIS equipment has been upgraded in a timely manner. Ships with the older models of ECDIS equipment that conform to the earlier IMO performance standards as set out in A.817(19) and is in conformance with IMO SN Circ.266/Rev.1, will be considered to comply with all the necessary requirements. However, if ECDIS is used to fulfil the SOLAS chart carriage requirement, it will be difficult for older ECDIS equipment to be maintained to the latest international standards as promulgated by IMO (e.g. existing guidance in SN.1/Circ.266/Rev.1).

With older ECDIS units (hardware), difficulties have been observed when upgrading ECDIS software. At least one ECDIS manufacturer has confirmed to IHO that their older hardware (built before 2003) cannot be upgraded with new software.

11. What is AMSA's view on the time schedule for manufacturers to provide a software upgrade to the latest IHO standard (e.g. PL v3.4)?

It is acknowledged that there needs to be some practical consideration given to a reasonable time period to comply with the latest IHO standards. IMO Circular SN.1/Circ.266/Rev.1 mentions the need to maintain ECDIS in accordance with the relevant IHO Standards. The same circular notes that an up-to-date list of all relevant IHO Standards relating to ECDIS equipment is maintained within the "About ENCs" section of the IHO website.

It is understood that if IHO makes a change to their standards, there has to be some time allowed for the manufacturers to redesign their software and take what action is necessary before the manufacturer can deliver a compliant product. As such, the "ideal schedule" for the upgrading of ECDIS to meet the latest IHO standards cannot be easily defined. An acceptable schedule should take account of what can reasonably be achieved and will depend on the circumstances of each case.

An important mitigating factor in relation to this issue is whether ship's officers are aware of any limitations that may result from an ECDIS not being compliant with any particularly new IHO standards and to be able to continue to use the ECDIS in a safe and efficient manner.

12. Will AMSA accept an older ECDIS unit whose software was improved say against "some wreck display problem" as previously advised by IHO circular letter, but the ECDIS does not still comply with the IHO PL v3.4?

Will AMSA accept an older ECDIS unit whose software was not improved, but ship's crew advise the date of upgrading software in the future? Say for example the manufacturer provides a letter/e-mail etc., confirming when the software will be upgraded?

AMSA does expect ECDIS software to be up to date and, within reason, to comply with the latest versions of applicable IHO standards. Similar to chart corrections, AMSA will consider a practical and achievable timeline for any needed software upgrades to take place.

Acceptance of the use of older ECDIS equipment whose software was not improved/upgraded will depend on how the ECDIS unit is being used on board. Any risks should be addressed by carrying out an appropriate risk assessment. Mitigating actions could include carrying a paper chart back-up and by making reference to the paper charts, particularly when passage planning.

AMSA recognises the nature of shipping including long sailing times between ports. In such circumstances there should be evidence on board to indicate that any pending upgrades are scheduled to take place in the near future.

TRAINING

13. Can ECDIS be used as a training aid on board?

Yes, ECDIS can be installed on board and used solely for training purposes until such time when the use of ECDIS becomes mandatory for the ship in question. If ECDIS is carried on board as a training aid, an official letter from the flag administration or from the relevant Classification Society should be provided to confirm this. Where ECDIS units are installed on board as a training aid, they should be appropriately marked ("for training purpose only") and must not be used for navigation. In such cases, ECDIS must not be listed in the ship's "Record of Equipment" form.

14. What are the ECDIS training requirements for masters and officers in charge of a navigational watch serving on ECDIS fitted ships?

Under the provisions of Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Convention, there has been a long-standing 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 ENCs and RNCs, and hence includes the use of ECDIS. In respect of seafarers who commenced an approved education and training programme before 1 July 2013, there remains a clear requirement that approved ECDIS training (as outlined below below) be undertaken by all masters and officers in charge of a navigational watch on ECDIS-fitted ships.

Generic ECDIS training: All masters and officers in charge of a navigational watch should, as a minimum, complete generic ECDIS training that follows IMO Model Course 1.27 and conforms to the relevant STCW requirements.

Familiarisation training: All masters and officers certificated under Chapter II of the STCW Convention are to be familiar in accordance with STCW Convention Regulation I/14 with the ECDIS units fitted on board their ships. The requirement for familiarisation is further recognised under the provisions of sections 6.3 and 6.5 of the ISM Code. Resources supplied by the ECDIS manufacturers (such as in the form of a CD or DVD) may form part of the ECDIS familiarisation training. 'Trickle-down training' (i.e. one officer training another) is not acceptable without a structured and formalised process being in place to facilitate such training.

If the generic training includes the particular type (i.e. same make and model) of ECDIS equipment installed on board, such training may fulfil the requirement for both generic and familiarisation training. In such cases, a clear statement to this effect should be included in the ECDIS training documentation. Masters of ECDIS fitted ships should ensure that all officers in charge of a navigational watch are competent in the safe and effective use of the ship's ECDIS.

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. Training requirements in accordance with the 2010 Manila Amendments become effective on 1 July 2013.

15. What are the contents of ECDIS familiarisation training? What sort of training will be accepted by AMSA as ECDIS familiarisation training?

ECDIS familiarisation training relates to training for the specific make and model of the ECDIS equipment fitted onboard. Familiarisation training refers to the process required to become familiar with any on board ECDIS equipment (including back-up) before taking charge of a navigational watch. In accordance with the ISM

Code, the company should establish procedures, plans and instructions, including checklists, for key shipboard operations such as the use of ECDIS for navigation. The requirement for familiarisation is recognised under the provisions of section 6.3 and 6.5 of the ISM Code.

Familiarisation training will be needed for each ECDIS a Master or a navigating officer is expected to operate. This training should build on the approved ECDIS generic training (based on IMO Model Course 1.27), and be delivered by a suitable person or organisation, such as the ECDIS manufacturer, the manufacturer's approved agent or another qualified trainer. A manufacturer's computer based training package may be accepted for this purpose.

If the generic training includes training on the particular type (i.e. same make and model) of ECDIS equipment installed on board, such training can be considered to fulfil the requirement of both generic and familiarisation ECDIS training. A clear statement to this effect should be included in the ECDIS training documentation. The master is required to verify that the ECDIS familiarisation requirements are observed and documentary evidence of such training is kept on board.

The ECDIS familiarisation training should contain information required for the safe and effective operation of the on board ECDIS for navigation and to avoid distractions from peripheral functions in the ECDIS. As a minimum, such training should cover the following areas:

- familiarisation with available functions
- familiarisation with the menu structure
- display setup
- setting of safety values
- recognition of alarms and malfunction indicators and action to be taken
- route planning
- route monitoring
- changing over to backup systems
- loading charts and licenses
- updating of software

Considering above, "trickle-down-training' (i.e. one officer training another) is not acceptable, as it leads to incomplete knowledge of the equipment capabilities, and especially the lesser used functions. The UK Nautical Institute has developed a useful check list on ECDIS familiarisation that lists the key tasks for using ECDIS as a means of navigation.

16. With regard to the familiarisation training of ECDIS, what is meant by 'structured and formalised process'?

AMSA considers that trickle-down training (i.e. one officer training another) is not acceptable without there being a 'structured and formalised process' in place to facilitate such training. The phrase '**structured and formalised process**' means that the conduct of ECDIS familiarisation training should include the following:

- **Qualified instructor**

  This course may be delivered by a suitably qualified person or organisation, such as the ECDIS manufacturer, the manufacturer's approved agent or another qualified trainer. A manufacturer's computer based training package may be accepted for this purpose.

  The person conducting the training should possess an ECDIS train-the-trainer qualification or must have successfully completed an approved ECDIS training course with adequate navigating experience on ECDIS.

  For Australian registered ships, the instructor must hold an Australian Certificate IV in Training and Assessment (TAE40110) or an equivalent qualification.

- **Clearly defined course content**

  The course content should focus on the functionality and effective use of ECDIS equipment fitted on board. A document outlining the list of specific subject matters (training areas) and a description of the sub-topics being covered under each subject should be provided. ECDIS manufacturer's manual or other relevant course documents should be provided to trainees for easy reference.

- **Well organised lesson plan**

  A lesson plan with appropriate delivery method and time duration (time spent on each subject/element) should be prepared. This should reflect how the course objective will be achieved within the defined timeline. Focus should be upon achieving and demonstrating the necessary competencies, rather than time spent on training or achieving certification alone.

- **Practical evaluation**

  This includes the practical demonstration of key navigational tasks to assess the competency of a Master or a navigating officer. For the purpose of effective evaluation, a proficiency checklist should be used based on key navigational functions and settings. Whilst evaluating competence, it will be necessary to verify if the information from the ECDIS was correctly interpreted and properly analysed taking into account the limitation of the equipment.

- **Record keeping**

  In addition to appropriate record keeping by the shore management, documentary evidence of conducting ECDIS familiarisation training must be kept onboard. Given the critical nature and importance of conducting such training, the procedures involved in recording this training should be incorporated in the ship's Safety Management System.

17. Does AMSA plan to endorse ECDIS qualification on Australian Certificate of Competency (COC)?

Yes. Similar to petroleum and other endorsements of STCW short courses on the Certificate of Competency (CoC), AMSA intends to endorse ECDIS qualifications on Australian CoCs. Such endorsement of ECDIS qualifications refer to Generic ECDIS training as mentioned in the STCW Code Table-II/1 (for navigation at operational level) or table A-II/2 (for navigation at management level).

For non-Australian CoCs, the fulfilment of ECDIS training requirements should be evidenced by appropriate endorsement or certification, as appropriate. This includes separate documentary evidences for ECDIS generic as well as familiarisation training.

MISCELLANEOUS

18. What is meant by an ECDIS anomaly?

An ECDIS anomaly is an unexpected or unintended behaviour of an ECDIS which may affect the use of the equipment or navigational decisions made by the user. Examples include, but are not limited to:

- failure to display a navigational feature correctly
- failure to alarm correctly
- failure to manage a number of alarms correctly

In October 2011, the IHO produced an ECDIS and ENC Data Presentation and Performance Check Dataset for ships to test for the presence of the more serious known anomalies:

- the display of navigation areas recently recognised by IMO such as ESSA (Environmentally Sensitive Sea Area), PSSA (Particularly Sensitive Sea Area) and ASL (Archipelagic Sea Lane)
- the display of lights with complex characteristics
- the display of underwater features and isolated dangers
- detection of objects by "route checking" in voyage planning mode

19. Is there a list of commonly identified ECDIS anomalies?

Yes, a list of commonly identified ECDIS anomalies has been provided in IMO SN1/Circ 312. A copy of this document is attached to these FAQs.

Further enquiries on ECDIS can be addressed to:

Manager
Ship Inspections and Registration
Maritime Operations Division
Australian Maritime Safety Authority
GPO Box 2181
CANBERRA ACT 2601

INTERNATIONAL MARITIME ORGANIZATION

E

4 ALBERT EMBANKMENT
LONDON SE1 7SR
Telephone: +44 (0)20 7735 7611 Fax: +44 (0)20 7587 3210

SN.1/Circ.312
9 July 2012

SAFETY OF NAVIGATION

OPERATING ANOMALIES IDENTIFIED WITHIN ECDIS

1 The Sub-Committee on Safety of Navigation, at its fifty-eighth session (2 to 6 July 2012), was tasked by the Maritime Safety Committee at its ninetieth session to circulate further guidance or information that becomes available on operating anomalies identified within ECDIS to supplement the guidance in MSC.1/Circ.1391, and has developed the attached information for the guidance of all concerned.

2 Member Governments are invited to bring the attached information, in the annex and appendix, to the attention of all concerned and, in particular:

.1 ensure that mariners are aware of the potential for some ECDIS to exhibit display and alarm behaviour anomalies;

.2 alert mariners to the characteristics of these anomalies;

.3 note the list of the currently identified anomalies and related advice;

.4 alert the maritime community to the existence and use of the International Hydrographic Organization (IHO) Data Presentation and Performance Check (DPPC) dataset and to ensure that all installed ECDIS and training equipment is checked; and

.5 continue to observe the guidance in MSC.1/Circ.1391 dated 7 December 2010 in particular to encourage vessels under their flag to report anomalies with sufficient detail on the ECDIS equipment and ENCs to allow analysis.

***

ANNEX

OPERATING ANOMALIES IDENTIFIED WITHIN ECDIS

Introduction

1 The following information and guidance is provided to assist all those involved in the use of ECDIS.

ECDIS anomalies

2 A number of ECDIS operating anomalies have been identified. Due to the complex nature of ECDIS, and in particular because it involves a mix of hardware, software and data, it is possible that further anomalies may exist.

3 These anomalies are particularly apparent in ECDIS units that have been built and type-approved to ECDIS Performance Standards (resolution A.817(19), as amended), (i.e. before 2009). However, ECDIS units type-approved to the revised ECDIS Performance Standards (resolution MSC.232(82)) are still vulnerable to the limitations in appendix, item 5(a).

4 An ECDIS anomaly is an unexpected or unintended behaviour of an ECDIS unit which may affect the use of the equipment or navigational decisions made by the user.

5 Examples include, but are not limited to:

- failure to display a navigational feature correctly, such as:
  - navigation areas recently recognized by IMO such as PSSA (Particularly Sensitive Sea Area) and ASL (Archipelagic Sea Lanes);
  - lights with complex characteristics; and
  - underwater features and isolated dangers;
- failure to detect objects by "route checking" in voyage planning mode;
- failure to alarm correctly; and
- failure to manage a number of alarms correctly.

6 The existence of such anomalies highlights the importance of maintaining ECDIS software to ensure that operational capability and reliability are maintained in accordance with SN.1/Circ.266/Rev.1. It is recommended that appropriate checks are made with the equipment manufacturer. This is of particular importance where ECDIS is the only source of chart information available.

7 A list of the known anomalies with advice, and information on whether or not the DPPC dataset checks for each anomaly, is in the appendix.

IHO ECDIS Data Presentation and Performance Check (DPPC) dataset

8 IHO has produced an ECDIS DPPC dataset that allows mariners to check some important aspects of the operation of their ECDIS. This dataset contains two fictitious ENC cells which navigating officers can load into their ECDIS units to assess operating performance and to

determine whether there may be any display anomalies that either need to be remedied or otherwise managed in the way that the ECDIS is operated. If the check highlights a problem, the accompanying guidance notes with the check dataset offer suggested courses of action. The check dataset and accompanying instructions can be obtained from ENC service providers, or can be downloaded from the IHO website at:
www.iho.int/srv1/index.php?option=com_content&view=article&id=585:news&catid=166:1news-links&Itemid=828.

Appendix

LIST OF ECDIS APPARENT OPERATING AND DISPLAY ANOMALIES (NOT IN PRIORITY ORDER)

In the following list, items 1, 2, 3, 4, 5(b), 6, 7, and 11 are checked by the IHO DPPC dataset dated November 2011:

1 Inability to correctly display symbols for recently-approved IMO features such as ASLs or PSSAs (SN.1/Circ.266/Rev.1 refers) – ECDIS equipment that does not have the latest version of the IHO Presentation Library installed will, instead of displaying the correct symbol, either show question marks (?) or nothing at all. In some cases the ECDIS may fail to load an ENC that includes such data. An ECDIS retains its type approval certificate regardless of the version of the Presentation Library installed.

Workaround – interrogate any "?" symbol displayed using the "pick report" or refer to paper charts and/or publications.

2 Incorrect display of foul areas and obstructions in some ECDIS equipment – some ECDIS models do not show some underwater features in Standard display mode as expected (however they do activate appropriate alarms). These features are only displayed when the "All" or "Other" display mode is used. Also in some cases different symbols are used to depict these features.

Workaround – use Mode "All" or "Other".

3 On some occasions some stranded/dangerous wrecks and obstructions may not display in any mode; it is believed that this is limited to some ECDIS versions from a single manufacturer who has now produced a software amendment to resolve the problem.

Workaround – use paper charts.

4 An object that falls on a contour line may fail to display in "Standard" Mode in some ECDIS equipment.

Workaround – use Mode "All" or "Other".

5 Small (point) land areas, especially those depicted only on small scale (usage band 1 and 2) ENCs may not always be clearly displayed and do not always activate alarms in route planning or route monitoring modes in some ECDIS equipment:

(a) it is possible for small land features to be obscured by other chart detail such as names or contour labels; and

(b) some ECDIS equipment may not conduct route checks on small scale ENCs and may not therefore provide an appropriate warning. Where this is the case the land area may not be detected by the "look-ahead" function during route monitoring.

Workaround – careful manual inspection of the largest scale ENC available.

Due to the limitations of ECDIS referred to in 5(a) above, mariners (even those using the most modern systems) should always undertake careful visual inspection of the entire planned route

using the "Other/All" display mode to confirm that it, and any deviations from it, are clear of dangers.

6 Incorrect display of the coloured arcs of light sectors – some ECDIS may not display the coloured arcs of complex lights as intended. This is especially prevalent where the sectors straddle 0/360deg (North).

Workaround – use "pick report" function to check light sectors.

7 Some early models of ECDIS are unable to display correctly time-variable data encoded in ENCs. For example features with Date Start and Date End attributes used for the implementation of new Traffic Routeing measures in ENCs may not be depicted correctly; the result being that both old and new instances are displayed simultaneously. Tests for this were not included in IEC61174 Ed1.

Workaround – use "pick report" function to determine Start/End date/time.

8 Tidal stream data not available in usable form – some early models of ECDIS only provide a comma-separated list of values which is difficult to interpret and use.

Workaround – use Tidal Stream Atlases external to ECDIS.

9 Display of anchorage, berth and channel names may not be easily visible to the mariner and the radius of a maximum swinging circle may not be shown.

Workaround – use "All" or "Other" display mode and "pick report" function to obtain swinging circle information; VTS/Port Authority communications will be able to clarify any necessary names.

10 Three hundred and sixty degree landfall lights not always prominent in comparison to shorter range sector lights.

Workaround – mariners to be aware – use "pick report" to verify light characteristic.

11 ENCs may include certain shoal soundings, especially reported depths, which have been encoded in such a way that they do not display in "Standard" Mode and might not activate an alarm even where the depth is less than the safety contour setting. Most Hydrographic Offices have reported to the IHO that they have updated the relevant ENCs to ensure that significant depths are displayed in Standard Mode.

Workaround – operate in a display Mode where all soundings are shown.

12 Areas of foul ground that have no known depth value may be depicted in some ECDIS as isolated dangers and shown in "Standard" mode; this can result in unnecessary screen clutter.

Workaround – no workaround for clutter problem, mariners to be aware and use "pick report" function to determine if the feature is a danger.

13 Where ECDIS includes an option to show isolated dangers in waters shoaler than the safety contour value the symbology used may vary between manufacturers.

Workaround – mariners to be aware and to use "All" or "Other" Mode when operating in such areas.

14 Screen clutter can be a problem when displaying smaller scale ENCs for areas where larger scale coverage is also loaded in ECDIS. This can be more apparent when the user zooms out. This is due to a combination of each manufacturer's ENC loading strategy and the individual ENC producer's encoding policy. Where HOs use SCAMIN (scale minimum) attributes on chart features then this problem is minimized. The intention of the IHO standard is that ECDIS should not display ENC data which has a compilation scale significantly different from the display scale in use. Improvements could be made, in future, by adopting a standardized ENC loading strategy based on a scale range defined within the ENC.

Workaround – the situation can be improved through use of the standard display mode during voyage monitoring and appropriate (but not over) use of the zoom function. This technique has been included in the IMO 1-27 Model Course syllabus.

15 In some ECDIS equipment the text for some notes in the ENC may be truncated or not displayed at all, and therefore is not available to the mariner.

Workaround – no workaround available; mariners should advise ENC service providers where they observe this problem.

16 Unnecessary alarms and indications – feedback from mariners shows that ECDIS can produce excessive and distracting alarms. This is due to a combination of the interpretation of the requirements of the ECDIS Performance Standards and the ENC encoding. Some control over the number of alarms and indications is available to the mariner in ECDIS built to the revised Performance Standards (resolution MSC.232(82)) but this is not always recognized.

Workaround – the methods available to minimize alarms are included in the IMO 1-27 Model Course syllabus.