



Marine Notice 11/2012 Supersedes 15/2010 and 7/2012

Guidance on ECDIS for ships calling at Australian ports

This notice aims to clarify some of the emerging issues relating to the carriage requirements for Electronic Chart Display and Information System (ECDIS) and to provide guidance for ECDIS-fitted ships calling at Australian ports.

As the mandatory carriage of ECDIS will be phased in from 1 July 2012 onwards¹, ship operators, masters and navigating officers of ECDIS-fitted ships are encouraged to take this guidance into account.

Two flow charts that address ECDIS-related issues and which will be used by AMSA's Port State Control (PSC) inspectors, are attached.

1. Safety Certificates under SOLAS

Details of a ship's navigational systems and equipment are recorded in the "Record of Equipment" attached to the relevant safety certificate 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 form containing the ship's "Record of Equipment". If a ship uses ECDIS for navigation, the "Record of Equipment" must clearly state the back-up arrangement in place. Additionally, if a ship requires flexibility in using either paper charts or ECDIS as the means of navigation, such an arrangement must be clearly indicated in the ship's "Record of Equipment". In such cases, both paper charts and ECDIS must comply with SOLAS requirements.

2. Determining the means of navigation

In determining the means of navigation being used, apart from considering the relevant form containing the ship's "Record of Equipment", AMSA's PSC inspectors will look for evidence of planning and presentation of the ship's route for the completed (or intended) voyage and of plotting and monitoring of the ship's positions throughout the voyage. This information may be cross-checked by the PSC inspectors against entries made in the ship's official documents such as the deck log book and manoeuvring book.

3. Compliant ECDIS

As per SOLAS Chapter V Regulations 18 and 19, for a ship to rely on ECDIS for navigation, the ECDIS equipment must conform to the relevant IMO Performance Standards. ECDIS units on board are required to comply with one of two performance standards (either IMO Resolution A.817(19) or MSC.232(82)), depending on the date of their installations.

Where ECDIS is being used for navigation, it must:

- i) be type-approved;
- ii) be maintained to the latest applicable International Hydrographic Organization (IHO) standards;
- iii) use official and up to date electronic charts; and
- iv) have an adequate, independent back-up arrangement.

¹Depending on ship type, size and construction date, as required by SOLAS regulation V/19.2.10

3.1 Type approval of ECDIS

In accordance with SOLAS Regulation V/18, ECDIS units on board ships must be type-approved. Type approval is the certification process that ECDIS equipment must undergo before it can be considered as complying with the IMO Performance Standards. The process is carried out by type approval organisations and marine Classification Societies. For Australian ships, AMSA has delegated type approval and certification of marine equipment to several Classification Societies as listed on the AMSA website at: www.amsa.gov.au/Shipping_Safety/Standards_and_Regulations/#class.

3.2 Maintenance of ECDIS software

An ECDIS that is not updated to the latest version of IHO standards may not meet the chart carriage requirement as set out in SOLAS Regulation V/19.2.1.4. IMO has issued SN.1/Circ.266/Rev.1 on the need to maintain ECDIS software. The following link provides a list of the latest IHO standards that apply to ECDIS equipment: www.iho.int/mtg_docs/enc/ECDIS-ENC_StdsIn_Force.htm.

3.2.1 ECDIS Data Presentation and Performance Check dataset

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 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 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.

3.3 Carriage of official electronic charts

Charts that are issued by or on the authority of a Government, authorised Hydrographic Office or other relevant government institutions are official and only these should be used to fulfil the SOLAS chart carriage requirement. There are two kinds of official electronic charts available: Electronic Navigational Chart (ENC) and Raster Navigational Chart (RNC).

Ships using ECDIS for navigation must carry ENC (which are official vector charts) or, where ENCs of an appropriate usage code (i.e. scale) for the ship's operations have not been published, RNC (which are scanned, geo-referenced images of official paper charts). Both ENCs and 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.

3.4 Back-up arrangements for ECDIS

Appendix 6 to the IMO ECDIS Performance Standards specifies the requirements for adequate, independent back-up arrangements. The main requirements are the ability to make a timely transfer to the back-up system during critical navigation situations and allow the ship to be navigated safely until the termination of the voyage.

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

- i) an independent, fully compliant second ECDIS unit, connected to ship's main and emergency power supplies and connected to systems providing continuous position fixing capability; or
- ii) a folio of adequate and up to date paper charts (including relevant large scale charts) necessary for the intended voyage.

The back-up ECDIS must be loaded with relevant official charts and the voyage plan before commencement of the voyage. Similarly, if paper

charts are being used as the back-up, they must be readily available and the voyage plan must be indicated on them. The back-up arrangement must be ready for immediate use, particularly when in confined waters.

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

4. Mode of ECDIS operation

A type-approved ECDIS, when using current editions of ENC with the latest updates and corrections available, operates in ECDIS mode. An alternative mode, known as Raster Chart Display System (RCDS) mode, can only be used if there are no suitable ENCs available for the area being navigated. In recent years, ENC coverage has increased rapidly. However, there may still be some areas, such as polar regions, for which suitably detailed ENCs have not been issued.

In Australia's case, ENCs exist for all well-used coastal shipping routes and for all major ports. Hence, unless a ship will be operating in or transiting through an area for which there are no suitable ENCs, ECDIS should not need to be operated in RCDS mode in Australian waters. IMO SN.1/Circ.207/Rev.1 addresses the differences between ECDIS and RCDS.

4.1. Charts to be used in areas not adequately covered by ENCs

ENC coverage of the world's busiest ports and their connecting shipping routes, is substantially complete. Away from major shipping routes, ENCs may be limited to small scale coverage. In circumstances where greater detail is required, it may be necessary to use RNCs. When planning a passage in more remote areas, mariners should note:

- i) any caution embedded in an ENC, advising of the need to refer to larger scale charts for some areas, and
- ii) any areas within an ENC showing no data within that scale band (usage code).

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.

5. ECDIS training requirements

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) be undertaken by all masters and officers in charge of a navigational watch on ECDIS-fitted ships.

5.1 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.

5.2 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.

6. ECDIS anomalies

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. 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

The IHO ECDIS check dataset (as mentioned in paragraph 3.2.1) provides a test facility for the presence of the more serious known anomalies, such as:

- 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 Lanes)
- 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

7. Port State Control inspections

AMSA's PSC inspectors are increasingly focussing on the means by which ships meet their SOLAS chart carriage requirements and the effectiveness with which the navigational task is being conducted.

The following is a non-exhaustive list of ECDIS-related issues which AMSA's PSC inspectors pay close attention to:

- appropriate declaration in the ship's "Record of Equipment" form
- ECDIS type approval certificate, confirming that the ship's ECDIS complies with the relevant IMO performance standards and the IEC (International Electrotechnical Commission) test standards
- maintenance of the ECDIS software to the latest applicable IHO standards
- use of latest edition official electronic charts, updated and corrected to the latest available updates and notices to mariners
- adequate independent back-up arrangements (as detailed on "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 undertaken by the master and officers in charge of a navigational watch
- documented procedures for using ECDIS
- listing of ECDIS as critical equipment in the ship's Safety Management System
- conformance and alignment with input from sensors (e.g. heading, speed, rate of turn etc) and presentation of such information on the ECDIS display
- evidence of periodic tests and checks of the ECDIS equipment that need to be carried out in accordance with the ship's Safety Management System
- demonstration of operational competency by the ship's navigating officers (e.g. safety checking of a voyage plan)

8. ECDIS flow charts

The attached flow charts outline ECDIS implementation and operational issues. These charts will assist AMSA's PSC inspectors when assessing the carriage requirement and use of

ECDIS on board. The assessment of any ECDIS related deficiencies (along with any remedial action determined) may vary, depending on the circumstances of each case, including any measures taken to limit risk and maximise safety.

AMSA has developed answers to a set of Frequently Asked Questions (FAQs) on ECDIS. It provides further information on regulatory, charting, software and training related issues. The ECDIS FAQs can be accessed from AMSA's website at: www.amsa.gov.au/Shipping_Safety/Navigation_Safety/ECDIS/ECDIS.asp.

Further enquiries regarding this marine notice can be addressed to:

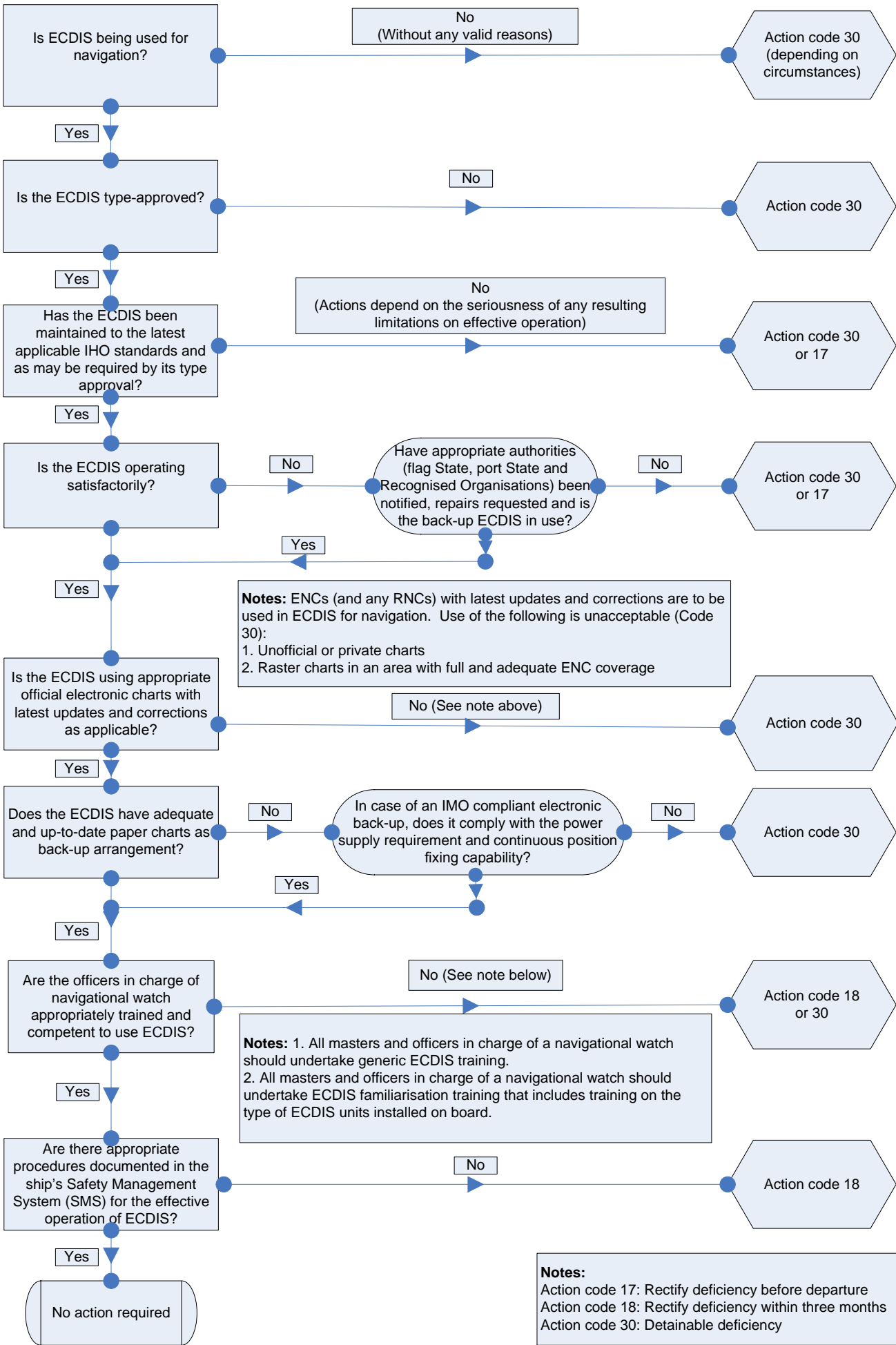
Manager
Ship Inspections and Registration
Maritime Operations Division

Australian Maritime Safety Authority
GPO Box 2181
CANBERRA ACT 2601

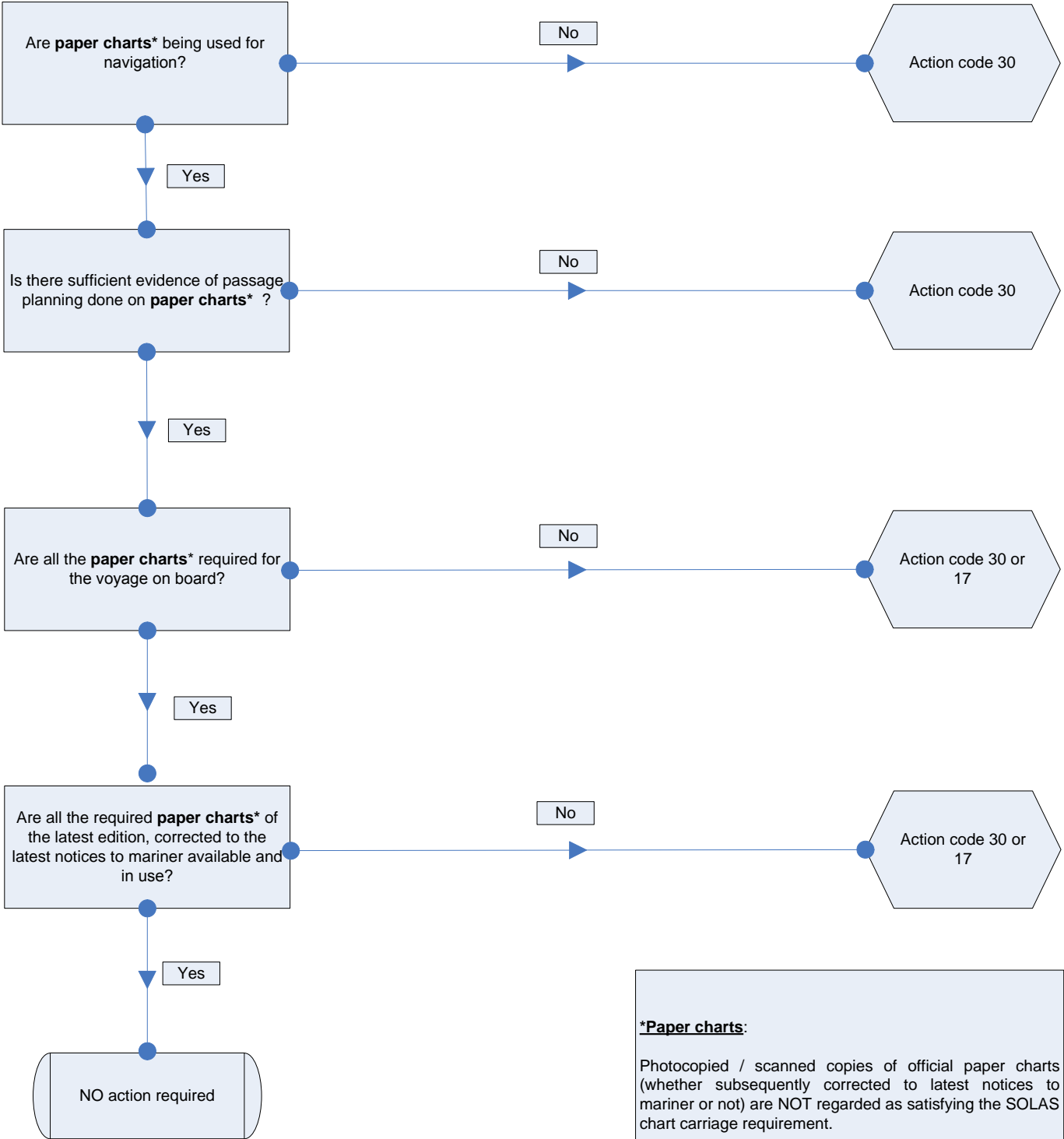
Mick Kinley
A/g Chief Executive Officer
27 June 2012

Australian Maritime Safety Authority
GPO Box 2181
CANBERRA ACT 2601
File No: 2012/1387

ECDIS listed
in the ship's
Record of Equipment Form



ECDIS **NOT** listed
in the ship's
Record of Equipment Form



***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