



PORTS and MARITIME AFFAIRS

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Directive No. SOLAS/16

ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEMS (ECDIS) REQUIREMENTS AND BACK-UP ARRANGEMENTS

Issued under the enabling power of the Ministerial Resolution 20/2016

Issue Date: 29 December 2016

1 Introduction

(1) With reference to;

- Ports and Maritime Affairs (PMA) Resolution no. 8/2016: regarding the implementation of the requirements of the International Convention for the Safety of Life at Sea, 1974 and its amendments
- SOLAS Regulation V/18 and 19 as amended: Carriage requirements for shipborne navigational systems and equipment. In particular Regulation 19.2.1.4, 19.2.1.5, 27
- IMO Resolution MSC.232(82) Annex 24: IMO revised performance standard for ECDIS, (2006)
- IMO Circular MSC.1 /Circ. 1503: ECDIS-Guidance for Good Practice, consolidates previous ECDIS circulars into a single document and provides additional guidance on ECDIS training.

(2) The PMA requires all Bahraini registered ships to which Regulation 19 of Chapter V of the SOLAS Convention applies are required to carry nautical charts and publications as per SOLAS Regulation V/27.

(3) This directive provides guidance to ship-owners and operators, port State control officers (PSCOs), Companies and Recognized Organizations (ROs) in respect to Electronic Chart Display and Information Systems (ECDIS) requirements and back-up arrangements under SOLAS Regulation V/19.



2 Definitions

Approval or Approved: Whenever the words “approval” or “approved” are used throughout this directive, they shall mean approval by an entity that has been delegated authority under written agreement to act on behalf of the PMA with respect to Statutory Certification and Services. See Directive No. SOLAS/02 “Type Approval Certificate for Bahraini Ships” for more details.

3 Application

Unless expressly provided otherwise, this directive applies to all Bahraini registered ships engaged on international voyages which are required to be fitted with an Electronic Chart Display and Information System (ECDIS) in line with its type and gross tonnage as per SOLAS Regulation V/19.10.

4 General

- (1) The carriage of ECDIS is mandatory for certain ships, including passenger ships, tankers and other cargo ships, as specified in SOLAS 1974, as amended, Regulation V/19.2.10.
- (2) STCW Regulation I/14.1.5 and International Safety Management (ISM) Code sections 6.3 and 6.5, require Companies to ensure seafarers are provided with familiarization training for the shipboard equipment.
- (3) The ship safety management system should include familiarization with the ECDIS equipment fitted, including its backup arrangements, sensors and related peripherals. Training resources including type-specific materials, provided by ECDIS manufacturers may form part of the ECDIS familiarization training.

5 ECDIS Requirements

The PMA accept an ECDIS installation as fulfilling SOLAS chart carriage requirements as per SOLAS Regulation V/27, provided:

- (1) The ECDIS system fulfils the requirements of SOLAS Regulation V/19.2.1.4
- (2) The back-up arrangements comply with SOLAS Regulation V/19.2.1.5
- (3) The main & back-up arrangements are completely independent of each other.



- (4) All systems fitted up to 31 December 2008 must comply with IMO Resolution A.817 (19) as amended.
- (5) All systems fitted on / after 1 January 2009 must comply with IMO Resolution MSC 232 (82) as amended.
- (6) Each system is type approved in line with SOLAS Regulation V/18
- (7) Owners / operators must ensure that an efficient and timely means of updating charts and ECDIS software is provided.
- (8) The owners / operator of the ship shall complete a risk assessment for the use of ECDIS on board each ship.
- (9) A copy of the approved risk assessment shall be placed on board for the guidance of the master and officers
- (10) A small number of general charts covering the ship's trading area are on board to enable the ship to safely approach the coast or a port in the event of a total electronic failure to obtain a full chart folio or a pilot. The scale and number of charts shall be based on results of the risk assessment or Master's passage planning.
- (11) The owners / operators of the ship shall include procedures for the use of ECDIS in the Safety Management System (SMS).
- (12) Masters and navigating watch-keeping officers must have completed training as required by STCW Convention and PMA Directives No. STCW/06 and No. STCW/15.

6 Flag State Approval

To obtain a Flag State letter of approval for the use of ECDIS as the main navigation system, owners / operators are required to submit documentary evidence to the PMA and the RO, stating that the above requirements have been fulfilled.

7 Risk assessment.

- (1) The risk assessment shall include an assessment of the Electronic Navigational Chart (ENC) and raster chart coverage of the ship's trading area.
- (2) The risk assessment shall include, but need not be limited to, the assessment of the following hazards:
 - a. Next chart unavailable



- b. Lack of anticipation of approaching and developing navigation hazards
 - c. Vessel may enter designated danger areas
 - d. Vessel position may shift between chart margins
 - e. Loss of navigation data
 - f. Navigation information not readily available
 - g. Accuracy of the chart may differ from accuracy of the position fixing system in use
 - h. Hardware failure
 - i. Software failure
 - j. Failure to up-date charts
 - k. Input failure – position
 - l. Input failure – course and speed
 - m. Virus infection
 - n. Total ECDIS failure
 - o. Power failure
- (3) The risk assessment should determine the minimum number of paper charts required to be carried so that, in the event of a total ECDIS failure, the ship will be able to safely navigate to a pilot station or position where a technician could board or charts could be delivered on board to enable the ship to enter port safely. This assessment may be made by the Company if the ship is on a regular trade, or, for vessels trading world-wide, by the master as part of voyage / passage plans.
- (4) Note that:
- (a) ENC charts may satisfy SOLAS chart requirements, provided there is an appropriate back-up.
 - (b) The appropriate back-up may be Raster charts or paper charts
 - (c) Where there is no ENC chart coverage, then Raster charts may be used as the primary chart system, provided this is backed-up with a folio of paper charts.
- (5) If non-official chart data is used in an ECDIS, or if the back-up is missing, or if the charts are out of date, then the ECDIS no longer complies and fails to satisfy the SOLAS chart carriage requirements.



8 Back-Up Arrangements

- (1) Local electronic versions of charts and publications issued by a third party pertaining to geographical areas of a country may be accepted if that third party regularly receives official data and updates to its charts and publications from a SOLAS Contracting country.
- (2) The assessment of the acceptability for use on board for the above electronic products should be carried out by the Company, taking into account the above guidance on equivalence.
- (3) For the purposes of compliance with SOLAS 1974, as amended, Regulation V/19.2.1.5 the following back-up arrangements are deemed acceptable for Bahraini registered ships:

Primary System	Back-up arrangement
ECDIS operating with electronic navigational chart (ENC) mode	Either A 2 nd independent ECDIS, which has a separate power supply and data input, operating with electronic navigational chart (ENC) mode. OR Paper charts (adequate and up to date) for intended voyages.
ECDIS operating in the Raster Chart display system (RCDS) mode	Paper Charts (adequate and up to date) for intended voyages

- (4) Masters should be guided by the limitations of RCDS as outlined in the IMO Safety of Navigation Circular SN.1/Circ.276

9 Revision History

Revision No. 1 of the present Directive is the first revision.

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Undersecretary for Ports and Maritime Affairs
29th December 2016