INTERNATIONAL HYDROGRAPHIC ORGANIZATION

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CIRCULAR LETTER 18/2012

10 February 2012

UPDATE REPORT ON IHO ACTION CONCERNING ECDIS SOFTWARE ISSUES

References:
a) IHB Circular Letter 46/2011 dated 1August - *ECDIS Presentation Test for Ships*
b) IHB Circular Letter 15/2012 dated 6 February 2012 – *IHO Hydrographic Services and Standards Committee (HSSC), 3rd Meeting, Monaco, 8-10 November 2011*
c) IHB Circular Letter 68/2011 dated 3 November 2011 – *2nd IHO Technical workshop on ECDIS Software Issues*
d) IHB Circular Letter 36/2011 dated 15 June 2011 – *57th Session of the IMO Sub-Committee on Safety of Navigation*

Dear Hydrographer,

IHO Data Presentation and Performance Checks for Ships

1 As reported at Reference a), a simple user validation check has been made available by the IHO to all ships using ENCs. This was done in support of concerns raised within the IHO and at the International Maritime Organization (IMO) relating to operating anomalies identified with ECDIS, the portrayal of chart data and the need to maintain ECDIS software so as to keep pace with changing requirements and the evolution of the relevant supporting standards.

2 By the end of January 2012, the IHB had received results of checks on ECDIS from almost 400 sea-going respondents. The results received covered 15 of the approximately 25 (as known by the IHO) manufacturers of type-certified ECDIS. Results continue to be received.

3 A significant number of ships reported that they were unable to clearly identify the recently IMO-adopted ASL, PSSA or ESSA objects on the ECDIS display. Ships reported that lights with complex characteristics such as multiple coloured sectors were not displayed as intended by the IHO standards. The display of underwater features and isolated dangers was reported as variable across the different manufacturers' systems however in most cases the display gave a safe, if not entirely correct, interpretation of the ENC data. A high proportion of ships reported that navigationally significant objects, such as certain land features, an "area to be avoided" and a marine aquaculture installation, did not raise an appropriate warning in the route checking mode of ECDIS. Few ships in the nearly 400 reports received by the IHB appear to have an ECDIS that successfully passed all parts of the IHO checks.

4 The checks that have produced negative results vary both between manufacturers and also between different software versions from the same manufacturer. No check reveals the same failure across all 15 manufacturers' systems reported to the IHB. This appears to confirm that certain parts of the requirements of the ECDIS standards have been interpreted and implemented in different ways by different manufacturers. Several IHO Working Groups are already reviewing the relevant standards to make them as clear as possible. It also indicates that as problems become known, continuing improvements are being made to individual manufacturer's software over time. But it

also indicates that when a manufacturer has updated or improved its software, this does not appear to be widely implemented in ECDIS equipment already in use at sea.

Review of the IHO standards related to ECDIS

5 The 3rd meeting of the Hydrographic Services and Standards Committee (HSSC) in November agreed on the need to continue to review the relevant IHO standards to ensure that all possible ambiguities or inconsistencies were identified and resolved. This would assist ENC producers, ECDIS manufacturers and ECDIS testing authorities to better implement the IHO standards as intended. This is reported in the record of the meeting promulgated at Reference b).

2nd IHO Technical Workshop on ECDIS Software Issues

6 The IHO hosted a technical workshop at the International Hydrographic Bureau in Monaco from 25 - 26 January 2012. The workshop adopted a similar format to that held at the IHB in February 2011 (see Reference c)). The workshop was attended by 30 leading representatives drawn from stakeholder groups including IHO and IMO Member States; Intergovernmental Organizations, Non-Governmental International Organizations, data service providers, and ECDIS manufacturers. The purpose of the workshop was to review the feedback received from the IHO Data Presentation and Performance Checks for Ships and to develop advice and possible action for further consideration by stakeholders including the IMO.

7 The participants of the workshop supported IHO action to:

- seek further distribution of the Data Presentation and Performance Checks for Ships, such as advertising its existence in Notices to Mariners
- continue to analyse the results of the checks and provide a verbal update at MSC90;
- maintain dialogue with each ECDIS manufacturer to clarify reported discrepancies and to ascertain what remedial action has been taken or is intended by those manufacturers; and
- continue the review of relevant IHO standards to further resolve any ambiguities that might lead ENC producers, ECDIS manufacturers or equipment certification authorities to inappropriately implement the intentions of the standards.

8 As well as acknowledging the work items that the IHO already has in its programme, the participants at the workshop were invited to suggest any new proposals or work items that the IHO might wish to consider to further address the issues affecting ECDIS data portrayal and performance. There were no new proposals. This is an indication that the IHO is taking appropriate action.

9 The participants at the workshop were of the opinion that irrespective of the substantial efforts now being made by the IHO, ECDIS manufacturers and equipment type-testing authorities to ensure that ECDIS meets the latest standards and requirements adopted by the IMO, there is no specific regulatory requirement for ship operators to update ECDIS systems that are already at sea and being operated under an old but valid type approval certification. Equally there is no easy way for ship operators to know when a manufacturer has released a new version of their ECDIS software that resolves identified software issues. This situation is aggravated by the fact that under current arrangements ECDIS manufacturers often have difficulty in maintaining contact with ships in which their equipment is fitted. This means that any ECDIS equipment that fails to pass the recently issued IHO checks (either because it is not updated to the latest relevant standards or it contains unresolved software bugs), can still be used at sea to meet carriage requirements, even where it has deficiencies that may affect safety of navigation.

IHO Submission to IMO

10 Following up on the IHO report to last year's session of the IMO Maritime Safety Committee (MSC) and the verbal report made to its subordinate Sub Committee on Safety of Navigation (NAV) (see Reference d)) , the Directing Committee has prepared a submission to this year's session of MSC in which the outcomes of the IHO Data Presentation and Performance Checks for Ships and the 2nd Technical Workshop are described. A draft copy of the IHO submission is attached to this letter.

11 As a result of the information provided by the IHO in its submission to MSC, some IMO Member States are likely submit proposals seeking further action by IMO, particularly in relation to the maintenance of ECDIS software.

Further action by IHO Member States

12 As indicated in paragraph 4 of Reference a), Member states are urged to continue to raise the awareness of mariners and ship operators to the issues currently under discussion at IMO and in particular, to announce the existence of the IHO Data Presentation and Performance Checks for Ships through Notices to Mariners and other suitable communications outlets.

13. Member States, particularly those States that will be represented at the next sessions of the MSC and NAV, are encouraged to discuss the issues related to the less than optimal performance of official chart data in some manufacturers' ECDIS with their IMO representatives.

On behalf of the Directing Committee
Yours sincerely

Robert WARD
Director

Enclosure:

1. IHO submission to MSC90

Enclosure 1

MARITIME SAFETY COMMITTEE
90th session
Agenda item 10

MSC 90/10/X
13 February2011
Original: ENGLISH

Safety of Navigation Report of the fifty-seventh session of the Sub-Committee

Operating anomalies identified within ECDIS

Submitted by the International Hydrographic Organization (IHO)

SUMMARY

Executive summary:	This document reports on the actions taken by the IHO since MSC89 with respect to the "Operating anomalies identified within ECDIS".
Strategic Direction:	5.2
High Level Action:	5.2.4
Planned Output:	5.2.4.1
Action to be taken:	Paragraph 16
Related documents:	SOLAS Chapter V;SN.1/Circ.266 Rev.1; MSC.1/Circ.1221; MSC.1/Circ.1389;MSC.1/Circ.1391; MSC88/25/6; MSC88/26 paragraphs 25.19 to25.22; MSC89/24/2; MSC89/24/3; MSC89/25 paragraphs 24.6 to 24.9; and NAV57/15 paragraphs 14.38 to 14.48

Introduction

1 In Document MSC89/24/2 the IHO reported on the outcome of a workshop organised by the IHO to discuss "Operating anomalies identified within ECDIS" as raised by Japan, Norway, the United Kingdom, the International Chamber of Shipping (ICS) and the International Federation of Shipmasters' Association (IFSMA) in document MSC88/25/6. Australia, Canada, Chile, Japan, Norway, the United Kingdom, ICS and IFSMA submitted document MSC89/24/3 supplementing the report from IHO and proposing additional steps that ought to be taken. MSC89 after considering these documents referred the matter to the fifty-seventh session of the NAV Sub-Committee under their agenda item on "Any Other Business and invited NAV to advise MSC90 on the way forward. The matter was also referred to the COMSAR and STW Sub-Committees for careful consideration on an urgent basis.

IHO Standards

2 As reported in MSC89/24/2 the IHO initiated a review of the relevant IHO Standards to identify and remove any possible ambiguities in the interpretation of the Standards. This work is underway with some revisions already with IHO Member States for adoption. These revisions do not introduce any new substantive changes to the standards but seek to ensure that the existing standards are clear and unambiguous and so can be interpreted by manufacturers in a consistent manner.. This work will continue.

Meeting of interested parties hosted by the United Kingdom

3 In September 2011 the United Kingdom (UKMCA and UKHO) convened a meeting of interested parties in London. The meeting reviewed various issues where different ECDIS equipment had been identified as not performing as anticipated by the relevant standards. Eighteen anomalies, in other words, unanticipated behaviours, were identified. The anomalies range in their importance but include the possibility of significant charted features, for example, wrecks not displaying

appropriately on some manufacturer's models of ECDIS. This has obvious implications for safety of navigation. The meeting participants identified various actions that mariners could take in order to mitigate against the anomalies that have been identified, should they be present in any particular manufacturer's equipment. These actions are described in the documentation that accompanies the IHO check data. Unfortunately, there are cases that have been identified where the only mitigating action to overcome certain anomalies, such as wrecks not displaying at all, is to refer to paper charts for additional information.

4 The meeting also reviewed the "ECDIS and ENC Data Presentation and Performance Check for Ships" then being prepared by the IHO. This intention to issue such a check dataset was outlined in a verbal statement to NAV57.

IHO ENC/ECDIS Data Presentation and Performance check

5 The IHO ECDIS and ENC Data Presentation and Performance Check for Ships has been developed for a wide circulation to mariners using ECDIS and is designed to identify whether ECDIS being used in ships is based on the latest IHO Standards and can display and react to chart information as intended by the IHO. The checks include the more serious anomalies that have been identified. The check data was distributed in October 2011 through the normal ENC provider network and also made available for free download from the IHO web site. The checks cover:

- the display of navigation areas recently recognised by IMO (ESSA (Especially Sensitive Sea Area), PSSA (Particularly Sensitive Sea Area), 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

Feedback from mariners using this check data continues to be received at the IHO headquarters. Updated information can be provided verbally to the Committee at its 90thsession.

6 By the end of January 2012, the IHO had received results of the checks on ECDIS from almost 400 sea-going respondents. There are a number of possible reasons for the limited response rate. Not all mariners may have received the data, others may not have reported their findings if the checks were successful, some may have been unable to respond easily due to the lack of internet-based communications aboard.

7 The IHO ECDIS and ENC Data Check has revealed a number of shortcoming in some manufacturers' systems being used at sea, particularly in older systems. The results received by the IHO so far cover 15 of the approximately 25 (as known by the IHO) manufacturers of type-approved ECDIS. Whilst the number of responses received so far is relatively low in comparison with the total ECDIS fit throughout the world fleet, there are nevertheless some common issues in the results that merit further consideration.

8 A significant number of ships reported that they were unable to clearly identify the recently IMO-adopted ASL, PSSA or ESSA on the ECDIS display. Some ships reported that lights with complex characteristics such as multiple coloured sectors were not displayed as intended by the IHO. The display of underwater features and isolated dangers was reported as variable across the different manufacturers' ECDIS models, however in most cases the display gave a safe, if not entirely correct, interpretation of the ENC data. A high proportion of ships reported that navigationally significant objects, most importantly, some land features, but also "areas to be avoided" and a marine aquaculture installation, did not raise an appropriate warning in the route checking mode of ECDIS. Operating the ECDIS display in "full" rather than "standard" display mode, will overcome a number of the anomalies – but at the risk of creating a more cluttered display. Few ships in the nearly 400 reports received by the IHO appear to have an ECDIS that successfully passed all parts of the IHO checks.

9 With regard to anomalies for which the only mitigating action is to refer to paper charts, such as the inability to display certain wrecks and underwater obstructions in any mode of operation, these anomalies appear to apply to one manufacturer only. The IHO has made that manufacturer aware of the situation and has requested information be provided urgently on what remedial action is being taken and how affected vessels are being contacted to alert them to this shortcoming.

10 The checks that have produced negative results vary both between manufacturers and also between different software versions from the same manufacturer. No check reveals the same failure across all the ECDIS models produced by the 15 manufacturers' systems reported to the IHO. This appears to confirm that certain parts of the requirements of the ECDIS standards have been interpreted and implemented in different ways by different manufacturers. Several IHO Working Groups are already reviewing the relevant standards to make them as clear as possible. The results also indicate that as problems become known, continuing improvements have been made to individual manufacturer's software over time. However, the results also indicate that even when a manufacturer has updated or improved its software, this does not appear to be widely implemented in ECDIS equipment already in use at sea through an appropriate upgrading or software maintenance regime as described in SN.1/Circ.266/Rev.1 (Maintenance of Electronic Chart Display and Information System (ECDIS) Software).

Meeting of interested parties hosted by IHO

11 The IHO hosted a technical workshop at the International Hydrographic Bureau in Monaco from 25 - 26 January 2012. The workshop format and participation was similar to the workshop held in February 2011. It was attended by 30 leading representatives drawn from stakeholder groups including IHO and IMO Member States; Intergovernmental Organizations, Non-Governmental International Organizations, data service providers, and ECDIS manufacturers. The purpose of the workshop was to review the feedback received so far from the IHO ECDIS and ENC Data Check and to develop advice and possible action for further consideration by stakeholders including IMO.

12 The participants of the workshop supported IHO action to:

- seek further distribution of the Presentation and Performance Check for Ships, such as advertising its existence in Notices to Mariners
- continue analysis of the results of the checks and provide a verbal update at MSC90;
- continue dialogue with each ECDIS manufacturer to clarify reported discrepancies and to ascertain what remedial action has been taken or is intended by those manufacturers; and
- continue the review of its standards to further resolve ambiguities that might lead ENC producers, ECDIS manufacturers or equipment certification authorities to inappropriately implement the intentions of the standards.

13 Significantly, the participants at the workshop were of the opinion that irrespective of the substantial efforts now being made by the IHO, ECDIS manufacturers and equipment type-testing authorities to ensure that ECDIS meets the latest standards and requirements adopted by the IMO, there is no specific regulatory requirement for ship operators to update ECDIS systems that are already at sea and being operated under an old but valid type approval certification. Equally there is no easy way for ship operators to know when a manufacturer has released a new version of their ECDIS software that resolves identified software issues. The situation is aggravated by the fact that under current arrangements ECDIS manufacturers often have difficulty in maintaining contact with ships in which their equipment is fitted. This means that ECDIS equipment that will not pass the recent IHO checks based on the latest IMO requirements, especially those relating to the safety of navigation, can still be used at sea.

14 The participants at the workshop considered that the widest possible distribution and use of the check data would greatly assist in raising the level of mariner awareness that an ECDIS, like any other software based system, may be prone to "bugs" and shortcomings that are not related to the

ENC data and may require the use of operator "work-around" solutions until such time as a newer version of the software can be installed.

15 Finally, the workshop participants reasoned that further consideration of the matters related to "operational anomalies related to ECDIS" were best addressed and co-ordinated through IMO as they had particular implications for safety of navigation and therefore came within the remit of the Sub-Committee on the Safety of Navigation to consider further.

Action requested of the Committee

16 The Committee is invited to:

.1 note the summary review of the replies received from the IHO ECDIS and ENC Data Presentation and Performance Check for Ships,

.2 note the outcome of the ECDIS stakeholders' workshop hosted by the IHO, and

.3 take any further action it considers appropriate.

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