WORLD METEOROLOGICAL ORGANIZATION

JOINT WMO/IOC TECHNICAL COMMISSION FOR OCEANOGRAPHY AND MARINE METEOROLOGY (JCOMM)
EXPERT TEAM ON SEA ICE – FOURTH SESSION

STEERING GROUP FOR THE PROJECT GLOBAL DIGITAL SEA ICE DATA BANK (GDSIDB) – TWELTH SESSION

ST PETERSBURG, RUSSIAN FEDERATION
1 TO 5 MARCH 2010

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (OF UNESCO)

ETSI-IV GDSIDB-XI/Doc. 2.6.4(2) Rev 1
(18.II.2010)

ITEM 2.6.4

Original: ENGLISH

SEA ICE IN ENCs – PROGRESS IN CANADA

(Submitted by Marie-France Gauthier, Canadian Ice Service)

Summary and Purpose of Document

This document contains a status report on the progress that Canada has made with respect to sea ice information in Electronic Navigation Charts.

ACTION PROPOSED

The Expert Team on Sea Ice (ETSI) is invited to:

(a) Note and comment on the information in this document;

(b) Provide advice on future directions and activities to make further progress.

APPENDICES

1. Marine Information Objects Overlays, Ice Coverage Product Specification, Edition 1.0, Nov, 2008
2. Marine Information Objects Overlays, Ice Coverage Object Catalogue – Objects, Edition 1.0, Nov, 2008
3. Marine Information Objects Overlays, Ice Coverage Object Catalogue – Attributes, Edition 1.0, Nov, 2008
4. Ice MIO Product - Portrayal Recommendations Document

DISCUSSION

Introduction

1. An Electronic Navigational Chart (ENC) provides the data component of an Electronic Chart Display Information System (ECDIS), which is under review in many countries as an approved aid to navigation, and as the legal equivalent of a paper chart. However, a paper chart is not the only aid to navigation and, in ice infested waters, Ice Charts are also used. Therefore, the incorporation of floating ice data is a natural extension to an ENC system.

2. The presentation of ice data on an ECDIS is not necessarily a simple matter. One major difficulty is the potential clutter that the addition of ice data could cause on an ECDIS display. It may be that a chart display system can only operate as a true ECDIS without the ice information, and that the inclusion of an additional thematic group (layer) of ice information would downgrade an ECDIS to the lower status of an Electronic Chart System (ECS).

3. Marine Information Overlays (MIOs) consist of supplementary information to be used with Electronic Navigation Charts in ECDIS or ECS shipboard equipment. The Canadian Ice Service has produced a Product Specification for sea ice MIO products based upon the Harmonization Group on Marine Information Objects (HGMIO) “General Content Specifications for Marine Information Overlays (MIOs)”, Ver 1.1.1, 28 August 2007.

4. During the winter ice season 2008-2009, CIS regularly produced sea ice MIO products for the Gulf of St. Lawrence and for Labrador waters, for evaluation and testing purposes. It was hoped that these operational products would have been used in a “test bed” trial in the Gulf of St. Lawrence during winter shipping season (2008/2009).

Previous Activities

5. At the 2005 meeting in Ottawa of the International Ice Charting Working Group (IICWG), it was recommended that a review of the Draft V3.0 Ice Objects Catalogue by ice experts was needed to ensure harmonization with present ice community standards, including WMO Nomenclature and Symbology, and SIGRID-3 data transfer format. The U.S. National Ice Center (NIC) took that action. The NIC presented the results of that review to the 2006 meeting of the IICWG in Helsinki, Finland.

6. At the Helsinki IICWG meeting, an action was taken to prepare a new draft of the ECDIS Ice Objects Catalogue for submission to the WMO and the IICWG. The Canadian Ice Service (CIS) took on this review, which resulted in an updated Ice Objects Catalogue – Version 4. This updated version, unlike previous versions, is harmonized with WMO and SIGRID-3.

7. Version 4 was presented to the next meeting of ETSI in March, 2007, in Geneva. At that meeting, Version 4 was formally approved. Thus, an IHO S-57 Ice Objects Catalogue (V4) has been developed which is the basis for the information content for floating ice.

8. The objects, attributes and associated enumerations that comprise the Ice Objects Catalogue V4.0 were entered into the IHO Feature Catalogue Register currently managed by the U.K. Hydrographic Office. This work was also done by the Canadian ice Service (CIS). This work was completed in early 2008.

9. In order to transmit and display sea ice information on ECDIS or ECS, a Product Specification was required. It needed to conform to the General Content Specification for MIOs Version 1.1.1 that was developed by the IHO-IEC Harmonization Group on MIOs (HGMIO) and endorsed by IHO. Work on this activity started this summer, 2008.

Activities during 2008/2009

10. A contract was issued to CARIS Canada for the development of the technical documents related to the development of an MIO Product Specification.

11. Prototype ice overlay products were assembled and discussed with Canadian Coast Guard Icebreaking Services. An MIO product with ice polygons was decided upon. It was also agreed that semi-transparent coloring of ice polygons would be an effective way to not obscure the navigation chart information underneath the ice MIO.

12. A set of Ice Objects and Attributes were formulated and passed to CARIS. These were accepted and formed the set that comprised the test bed products. Additionally, CIS provided CARIS test ice data in SHP file format, to be used for test purposes.

13. Email contact was established with Russian and German agencies developing ice information overlays for ECDIS/ECS systems with a view to closer future collaboration.

14. Under their contract, CARIS delivered a final set of documents as follows:

a. Marine Information Objects Overlays, Ice Coverage Product Specification, Edition 1.0, Nov, 2008

b. Marine Information Objects Overlays, Ice Coverage Object Catalogue – Objects, Edition 1.0, Nov, 2008

c. Marine Information Objects Overlays, Ice Coverage Object Catalogue – Attributes, Edition 1.0, Nov, 2008

d. Ice MIO Product - Portrayal Recommendations document

e. A completed S-57 MIO Exchange Set from the CIS test data

f. Completed Installers for CARIS S-57 Composer and CARIS EasyView – for supporting the ice MIO Overlays.

15. At CIS, scripts were developed to generate SHP file data from the ISIS operational database. Regular generation of SHP file data was initiated.

16. The following ECDIS/ECS manufacturers were contacted and were sent a package of material to assist them in implementing upgrades to their systems so that users will be able to accept and display sea ice MIO products: ICAN Canada, Offshore Systems Ltd., Transas Marine USA, and NavSim Technology Inc. An ongoing dialogue has occurred with these companies, as they progress towards software support of sea ice MIO products.

17. CARIS provided S-57 and CARIS Composer training to CIS and Canadian Hydrographic Services (CHS) staff, at CIS, on 27-29th January 2009. In the last day of training, the end-to-end process of developing sea ice MIO products was tested and validated.

18. In early February 2009, production of test bed sea ice MIO products for Gulf and Labrador waters was initiated by CIS. Products were produced once per day, Monday to Friday, and placed on an “ftp” site.

19. By end of the winter season, April 2009, operational clients were not fully prepared to accept these products. However, the products were made available to manufacturers for testing of their ECDIS/ECS software offerings.

20. At the present time (March 2010), the CIS is awaiting feedback from the Canadian Coast Guard and the industry. It has not generated S-57 products since April 2009.

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