

**16<sup>th</sup> CHRIS Meeting  
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Ottawa, Ontario, CANADA**

**Report on IHO-IEC HGMIO**

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**1. Introduction**

Marine Information Objects (MIOs) consist of chart- and navigation-related information that supplement the minimum information required by ECDIS to ensure safety of navigation at sea. As related to the use of Electronic Navigational Chart (ENC) data, MIOs are additional, non-mandatory information not already covered by existing IMO, IHO, or IEC standards. Such information includes ice coverage, tide/water level, current flow, meteorological, oceanographic, and marine habitats. This supplemental information can exist as imagery, graphics, or additional S-57 objects/attributes. In 2001, a Harmonization Group on MIOs (HGMIO) was established between IHO and IEC to recommend additional data and display specifications that may be incorporated into future editions of IHO and IEC standards.

This report provides a brief overview of the scope of MIO activities from June 2003 to May 2004.

2. The second meeting of the **IHO-IEC Harmonization Group on Marine Information Objects (HGMIO)** was held on 14 June 2003 at the International Hydrographic Bureau (IHB) in Monaco. Seventeen persons attended representing eight member states, and included two IHB Directors and the IEC TC80 Secretariat. The main topics discussed at this one-day meeting were Terms of Reference, role and function of HGMIO, establishment of work priorities, review of the status of current MIO-related efforts, and the relationship of HGMIO to other IHO and IEC Committees/Working Groups.

**3. Current Status of MIO-related Efforts**

a. Ice Coverage – Task Leader: [Vacant]

An ECDIS Ice Objects Catalogue (Version 3.0) was published by Ice Services Canada (in cooperation with and the Canadian Hydrographic Service) in March 2001. Although these objects will be registered on the Open ECDIS Forum (OEF), there has been no formal request by any organization or Member State to have them included into IHO S-57 Edition 4. A recent study conducted at Ryerson University (Toronto, Canada) and the University of New Brunswick (Canada) developed a model for the integration of ice information into an ENC.<sup>1</sup> However, the suitability of this model needs to be determined by implementing it in a logical production environment, and then tested during an at-sea test/evaluation process. There have been informal proposals by *SevenCs* (Germany) on suitable colours and symbols for ice objects. However, they were prepared before the Ice Objects Catalogue was published. Currently, there is a graduate student at the University of New Brunswick (Canada) who is reassessing Ice Coverage colours and symbols in conjunction with the development of the Ice Coverage Prediction System. Although there had been some interest in conducting a testbed project in the Gulf of St. Lawrence/St. Lawrence River in Canada, this has not been formally proposed or scheduled.

b. Meteorological - Task Leader: Michel Huet (IHB)

Object Classes and Attributes for Weather (Version 1.0) were first proposed by *SevenCs* in November 1999. However, no colours or symbols for these objects have been developed or tested. Liaison is being established with a NATO group developing an Additional Military Layer (AML) on weather information with the aim to harmonize NATO and HGMIO developments on this matter. A list of S-57 objects and attributes on weather information that was developed by *SevenCs* has been proposed to the NATO group. It is hoped that this group and HGMIO can cooperate on developing an appropriate symbology for the display of weather information on ECDIS / WECDIS taking into account edition 3.3 of the IHO Presentation Library which was published in March 2004. Contact has also been made on this issue with a WG of the World Meteorological Organization. This group plans

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<sup>1</sup> El-Rabanny, Ahmed, Benson Agi, and David Coleman. 2004. "A Model for Automatic Integration of Ice Information into Electronic Navigational Chart," *International Hydrographic Review*, Vol. 5, No. 1, April 2004, p. 74-83.

to meet at *Ocean OPS 04*, Toulouse, France, 10-15 May 04. Dan Pillich, *SevenCs*, will represent HGMIO.

c. Tides/Water Levels - Task Leader: Lee Alexander (USA – Univ. of NH)

In 2001, *SevenCs* developed a tide-simulation model for a “tide-aware” ENC. Two ports were chosen (Singapore and entrance to Rotterdam) whereby prototype ENC data sets were produced containing single meter contours. A simulated 10-meter tidal range was then applied, and the display modified based on time and designated ship’s safety contour (depth). Further enhancements included designated tidal zones within the overall area. More recently, two research projects are being conducted at the University of New Hampshire (USA) in regard to developing dynamic tide and water level applications for the “Next Generation ENC” and for the “Chart of the Future.” The first phase involves the compilation and processing of high-density bathymetric data into a digital elevation model (DEM) using a combination of *CARIS* and *SevenCs* software tools. From this DEM (called a “Navigation Surface”) both S-57 3.1 ENC and gridded datasets will be produced. Phase 2 will look at various methods to incorporate vertical and time dimensions into existing ENC data. These “next generation” ENCs (i.e., capable of dealing with x,y,z and time) will be tested with existing ECDIS and ECS equipment that are currently installed onboard government and commercial vessels. Phase 3 will integrate real-time/forecast water depth information and port information services transmitted via an AIS communications broadcast into both the “next generation ENC” and with the “Electronic Chart-of-the-Future”. Preliminary trials are being planned for the Port of Hampton Roads, Virginia in Fall/Winter 2004.

d. Current Flow – Task Leader: [vacant]

In 1997, the Canadian Hydrographic Service, Quebec Region published an *Atlas of Tidal Currents for the St. Lawrence Estuary*, from Cap de Bon-Désir to Trois-Rivières. Based on an April 2004 meeting at the Maurice-Lamontagne Institute, Mont Joli, Quebec, there is now some interest to convert some of this data into S-57 objects that could be used with existing ENC data and ECDIS systems. However, a longer-term goal is to develop a gridded chart data models that can be used with both tide and current flow information.

e. Oceanographic – Max van Norden (US Naval Oceanographic Office)

A Technical White Paper: *Oceanographic Object Attribution* was prepared by the U.S. Naval Oceanographic Office in June 2002. It provides a useful overview of the activity and developments being undertaken in the field of oceanography that appear to be related to electronic charting. A number of new oceanography object classes and attributes were proposed. It is planned that these will be registered on the OEF as a mechanism to ensure that they are publicly available, can be used widely, and are practically tested. Further planned work includes:

- 1) Recommendations on oceanographic objects that should be addressed in an ECDIS.
- 2) Determine a suitable method for handling 3D data in a 2D environment.
- 3) Look at how to relate climatological and real-time data.
- 4) Assign attributes and colour tables to oceanographic objects.
- 5) Investigate how oceanographic data should be used with other data sets without introducing clutter.
- 6) Produce a sample dataset physical oceanographic objects for testing in an ECDIS.

f. Marine Habitats/Environmental Protection – Task Leader: [vacant]

Currently, there is no active development taking place. However, two proposed World Bank – Global Environmental Faculty projects now have a MIO component. These include:

South East Asia Marine Electronic Highway Project (Malacca Straits)

Gulf of Honduras Project (in Caribbean Sea)

USA-NOAA is also looking to establish a Coral Reef Initiative Project that will likely include a MIO component. There is also interest by Mexico to become involved in the development of MIOs for seafloor sediments/geology.

g. Vessel Traffic Services (VTS)

VTS information on ECDIS is not considered a form of MIO by IEC TC80/WG13. Similarly, the C&SMWG is not anticipating any involvement in VTS-display aspects. As such, there are no plans for HGMIO to address VTS-related information at this time.

#### **4. IMO Performance Standards for Display of Navigation-related Information**

In July 2003, IEC TC80/WG13 submitted to IMO NAV49 draft Performance Standards for the Presentation of Navigation-Related Information. It included an Annex for the harmonization of terms and symbols used to present navigation-related information. As defined in the performance standards, navigation-related information includes both chart and operational (ownership, radar, AIS, etc.). At IMO NAV49 it was decided that the more detail was needed to resolve conflicts and inconsistencies between individual performance standards (e.g., radar, ARPA, ECDIS, AIS, etc.). A correspondence group was established to further progress the work. This included the addition of more detailed display requirements. Also, IMO NAV49 felt that new performance standards should take precedence over existing equipment performance standards when conflicts regarding presentation issues occur. This past March 2004, the Correspondence Group submitted to IMO a draft Performance Standards for the Presentation of Navigation-related Information. Included with the Performance Standards are two draft Guidelines related to Symbols and Terms and Abbreviations. If adopted as an IMO Safety of Navigation Circulars (SN/Circ.), these symbols and terms would replace those contained in existing Performance Standards. This would have some impact on the work of HGMIO in terms of how MIO information should be displayed based on the new, harmonized display of navigation-related information.

#### **5. Present Activity/Future Work**

Currently, there is a relatively low level of activity by HGMIO members. In addition to the Chair, there are only two task leaders who are somewhat active. Unless there is specific tasking from IHO CHRIS or IEC TC80, work on MIO-related matters is regarded by most HGMIO members to be a low-priority. On the other hand, the Chair has been actively participating in IEC TC80/WG13 (Display of Navigation-related Information) and IHO TSMAD S-57 Edition 4 Sub-WG.

For the foreseeable future, HGMIO serves a useful purpose in providing developers of new ideas and applications the opportunity to bring such innovations to the attention of IHO and IEC. Further, if there becomes a circumstance where MIOs may impact on IHO and IEC activities, they may be considered, adopted or progressed by the relevant bodies as appropriate. HGMIO also provides an opportunity for “industry” involvement and communication of ideas/concepts with IHO. Interest in MIO-related matters may increase significantly if MIOs become a component of international development projects (e.g., funded by the World Bank) that have a hydrographic component.

#### **6. Next Meeting**

Based on discussions with currently active HGMIO members, it was agreed that there is no pressing need to hold a meeting during 2004. Most of the work of HGMIO will continue to take place via e-mail correspondence and the Open ECDIS Forum (OEF). Persons interested in participating or being kept informed of the activities of HGMIO can contact Dr. Lee Alexander at: [lee.alexander@unh.edu](mailto:lee.alexander@unh.edu).

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