

**Paper for Consideration by the
Joint 26th TSMAD and 5th DIPWG Meeting.
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Testing of ECDIS Equipment for Use in the Polar Regions

Submitted by:	IHB
Executive Summary:	The increasing volume of navigation in high latitudes highlights a need to ensure that type-approved ECDIS equipment is fit for purpose for these regions. This paper recommends adapting the tests included in IHO Publication S-64 - <i>IHO Test Data Sets for ECDIS</i> .
Related Documents:	- IHO CL 28/2013 dated 2 April - <i>Progress Report on IHO Contribution to the Development of a Mandatory Code for Ships Operating in Polar Waters (Polar Code)</i> . - Consolidated HSSC Work Plan 2013-2014, V1 - November 2012.
Related Projects:	Revision of IEC Standard 61174 - <i>Electronic Chart Display and Information System (ECDIS) Operational and performance requirements, methods of testing and required test results</i> .

Introduction / Background

1. The growth of ship traffic in the Arctic and Antarctic environments has led the International Maritime Organization (IMO) to consider the development of an international code of safety for ships operating in polar waters, known informally as The Polar Code. The Polar Code would cover the full range of design, construction, equipment, operational, training, search and rescue and environmental protection matters relevant to ships operating in the inhospitable waters surrounding the two poles.

2. While reviewing the hydrographic considerations that should be reflected in the Polar Code concerns have been expressed that currently neither the IMO Performance Standard for ECDIS nor the IEC test standard for ECDIS (IEC 61174) specifically mentions the display of ENCs at high latitudes. This paper briefly reviews the issue and outlines the way forward to address the testing of ECDIS for use in the Polar Regions.

Analysis/Discussion/Conclusions

3. The IMO Performance Standard for ECDIS includes a general requirement that "*The ENC and all updates to it should be displayed without any degradation of their information content.*" The methods of testing and the required results are specified by IEC Standard 61174 - *Electronic Chart Display and Information System (ECDIS) Operational and performance requirements, methods of testing and required test results*, which refers to IHO Publication S-64 - *IHO Test Data Sets for ECDIS*. The general provisions in the draft Polar Code include the following requirement: "*Systems for providing reference headings and position fixing shall be suitable for the intended areas.*" **Including an appropriate polar ENC data set in S-64 would be useful to ensure that this requirement can be confirmed during type testing.** The development of a polar ENC test dataset falls under the responsibility of TSMAD in accordance with task D of its work plan.

4. A summary review of paper charts and a sample of ECDIS displays indicates that a chart display based on a common projection such as the Mercator projection and standard calculations should be adequate up to 85° latitude. All navigable areas in the Antarctic have a latitude less than 85°. Much of the expected traffic in the Arctic region will operate at latitudes less than 85°N. This means that relatively few ECDIS-equipped vessels may be affected by issues related to the projection of ENCs in very high latitudes (higher than 85°N). **For these reasons it is not appropriate to seek a mandatory test for all ECDIS for ENCs in very high latitudes (higher than 85°N). Accordingly, the following adjustment of the ECDIS test procedure is proposed:**

- test all ECDIS with an ENC test data set ranging up to a latitude of 85°;
- add an optional test only for the equipment that will be used in very high northern latitudes (higher than 85°N).

5. In addition to general chart display issues, particular consideration is also required regarding route planning and route monitoring functions in a high latitude area including the North Pole itself. The Pole is a singularity where all the meridians converge, which may create difficulties for both displaying the chart information

and computing azimuths, bearings and distances. **Consideration of the display and associated issues including at the Pole itself must be assessed in liaison with ENC producers and ECDIS manufacturers.** This assessment and any resultant recommendations should also consider any impact on ENC product specifications and ENC production guidance pursuant to tasks E and F of TSMAD work plan.

Recommendations

6. Based on the discussion above, TSMAD should take the following actions:

- **determine**, in liaison with ENC Producers and ECDIS Manufacturers, the appropriate latitude range of the ENC test data set to ensure that all ECDIS operates correctly in that range and **adapt** accordingly the next edition of IHO Publication S-64 - Test Data Set for ECDIS that is currently under preparation ;
- **assess**, in liaison with ENC Producers and ECDIS Manufacturers, appropriate arrangements for the displaying and calculation aspects of ENC data in ECDIS at very high latitudes including at the Pole itself;
- **develop** a specific ENC test data set based on a representative very high latitude scenario and prepare associated guidance for inclusion as an optional test in the next edition of IHO Publication S-64.

7. These actions should be completed in 2014, in accordance with the target date for the completion of the Polar Code.

Justification and Impacts

8. The proposed actions would ensure that IHO standards support the requirements associated with the development of navigation in the Arctic region.

9. The actions need to be coordinated with the revision cycle of IEC Standard 61174.

Action Required of TSMAD

TSMAD is invited to:

- a. **consider** the actions recommended in paragraph 6;
- b. **agree** on an implementation plan;
- c. **report** to HSSC at its 5th Meeting.