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Working Party on Inland Water Transport

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 agenda item 7(h))

STANDARD FOR INLAND ECDIS

Transmitted by the Government of the Russian Federation

Note: At the twenty-eighth session of the Working Party on the Standardization of Technical and Safety Requirements in Inland Navigation (SC.3/WP.3), the delegation of the Russian Federation expressed its concern with regard to the divergence between maritime and inland navigation ECDIS standards. As a result of exchange of views on this issue, the Working Party suggested that the Russian delegation might wish to make a formal written proposal to the forthcoming forty-eighth session of the Working Party on Inland Water Transport explaining their view on the problem of compatibility between the two existing ECDIS standards and indicating the ways for its solution (TRANS/SC.3/WP.3/56, paras. 30-32).

Reproduced below is a written statement received from the delegation of the Russian Federation. The Working Party on Inland Water Transport may wish to have an exchange of views on this issue and decide as appropriate.

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PROPOSALS CONCERNING THE INLAND ECDIS STANDARD

A.   Preface

1.   Inland ECDIS Standard was elaborated by the Central Commission for the Navigation of the Rhine (CCNR) to promote inland navigation within Europe. It was decided that only an internationally agreed procedure will be successful and ECDIS originally developed for maritime navigation was also considered for inland navigation. The idea was to adapt ECDIS for inland navigation and supplement it with some distinct inland features, but not to change the original ECDIS standard. In this way, it would be possible to ensure a compatibility between the original maritime ECDIS and Inland ECDIS. This is important for the estuaries of navigable rivers, where sea vessels as well as inland vessels navigate as well as for vessels of sea - river navigation. As a result of examination carried out by Russian experts, it became evident, however, that the elaborators of the standard had gone away from the original concept. Herewith there are some results of the Inland ECDIS Standard analysis that, in our opinion, may help to bring the Inland ECDIS Standard concept closer to the IHO international maritime standards on Electronic Navigational Chart (ENC) and ECDIS.

B.   General

Structure

2.   Basically, Inland ECDIS Standard combines at least two original IHO standards for maritime ECDIS and ENC: S-57 and S-52. But it is named as "Inland ECDIS Standard", thus Inland ENC as a concept and a product, being independent from Inland ECDIS, does not exist. When we usually say about harmonization of Inland ECDIS Standard and S-57 Standard we are taking into account Inland ENC only, but not Inland ECDIS, because S-57 Standard defines the rules for maritime ENC production but not for ECDIS.

3.   S-52 Standard defining ENC display aspects for ECDIS is intended for ECDIS manufacturers, whereas S-57 Standard is mostly for ENC manufacturers. When inland administrations start to produce its own Inland ENCs, they will not apply to Section 1 of the Inland ECDIS Standard, because its importance for Inland ECDIS manufacturers.

4.   Moreover, it is impossible to propose some amendments to IHO S-57 Standard regarding addition of the river specific objects specification of Inland ECDIS Standard till it contains ECDIS items, because S-57 is not the ECDIS standard. Mixture of ECDIS and ENC related terms are evident.

5.   The Inland ECDIS Standard would be more operational being subdivided into two independent standards: Inland ENC and Inland ECDIS. In this case it would be possible to consider both inland standards independently: by inland ENC cartographers - within their frame of interests, and by Inland ECDIS manufacturers - for their purposes.

6.   Proposed to be appended to S-57 according to its procedures, Inland ENC Standard would be formulated as *Inland ENC Product Specification*.

Terminology

7.   There are no special Inland ECDIS related terms agreed, similar to the ones for maritime ECDIS. Possibly, they shall be necessary. Otherwise, different misunderstandings are possible. There are several examples below.

Inland ECDIS

8.   By definition from S-52 Glossary, Appendix 3 "Electronic Chart Display and Information System" (ECDIS) is a navigation information system, which with adequate back-up arrangements can be accepted as complying with the up-to-date chart required by regulation V/20 of the 1974 SOLAS Convention, by displaying selected information from a System Electronic Navigational Chart (SENC) with positional information from navigation sensors to assist the mariner in route planning and route monitoring, and if required display additional navigation-related information.

9.   By definition from Inland ECDIS Standard, chapter 2.1 "Inland ECDIS" means an electronic chart display and information system for inland navigation, displaying selected information from an Inland System Electronic Navigational Chart (Inland SENC) and, optionally, information from other navigation sensors."

10.   Proposed to be as "Inland ECDIS" is an **"*electronic chart display and information system" (ECDIS)* adapted for inland navigation.

Inland ENC

11.   By definition from S-52 Glossary, Appendix 3 the "Electronic Navigational Chart" (ENC) is a data base, standardized as to content, structure and format, issued for use with ECDIS on the authority of Government authorized hydrographic offices. The ENC contains all the chart information necessary for safe navigation and may contain supplementary information in addition to that contained in the paper chart (e.g. sailing directions) which may be considered necessary for safe navigation.

12.   By definition from Inland ECDIS Standard, chapter 2.1 b the "Inland Electronic Navigational Chart" (Inland ENC) means the database, standardized as to content, structure and format, issued for use with Inland ECDIS. The Inland ENC complies to the IHO standards S-57 and S-52, enhanced by the additions and clarifications of this standard for Inland ECDIS. The Inland ENC contains all essential chart information and may also contain supplementary information that may be considered as helpful for navigation.

13.   Proposed to be as the "Inland Electronic Navigational Chart" (Inland ENC) is the database, standardized as to content, structure and format, issued for use with Inland ECDIS. The Inland ENC complies to the IHO standards S-57, enhanced by the additions and clarifications of this standard for Inland ENC. ENC contains all the chart information necessary for safe navigation and may contain supplementary information in addition to that contained in the paper chart which may be considered necessary for safe navigation.

Miscellaneous

14.   Other examples requiring matching the terminology are given below.

15.   Inland ECDIS Standard, Chapter 1, d): "d) *Inland ECDIS can be designed for information mode only or for both, information mode and navigation mode*."

By definition ECDIS cannot be for information (not navigation) mode only, otherwise, it is not ECDIS but another non-navigational equipment.

16.   Inland ECDIS Standard, Chapter 3.1 c): "*If the chart is intended to be used for navigation mode (Ch. 5.2), at least the following objects have to be included in the ENC…:*"

ENC is not produced for any ECDIS display mode, if it is ENC by definition and issued according to S-57. It contains all information, and it is up to user or ECDIS, what amount of ENC information to display.

C.   Proposals to Inland ECDIS Standard Section 2 (Inland ENC)

17.   Speaking about harmonization between Inland ECDIS Standard and Russian, American (USA) or any other approach, we mostly bear in mind approach to ENC production and compatibility. Thus, leaving Section 1 of the Inland ECDIS Standard to ECDIS manufacturers and technical experts, we will mainly pay our attention to Inland ENC (Inland ECDIS Standard, Section 2) and S-57 relations.

18.   In Part 3 of S-57, clause 2.3 "Use of non-Object Catalogue codes and values" we will find the following directions for possible S-57 Object Catalogue extensions:

"*Every effort must be made to encode the features of an exchange set using the object classes, attributes, and attribute values identified in the IHO Object Catalogue (see Appendix A). However, where a feature cannot sensibly be described using values from the Object Catalogue, the encoder may define new object classes, attributes and attribute values, provided the following conditions are adhered to:*

-       *none of the definitions associated with the object classes or attributes in the IHO Object Catalogue is satisfactory for use;*
-       *the label/code and acronym used are clearly distinguishable from the labels/codes and acronyms reserved by the IHO Object Catalogue for both objects and attributes;*

- *all non-standard object and attributes labels/codes must be in the range 16388 to 65534;*
- *all non-standard object and attribute acronyms must be lowercase ISO/IEC 646 IRV characters;*
- *the non-standard usage is fully documented within the Data Dictionary Definition, Domain and Schema records (see clause 7.5).*

All labels/codes and acronyms currently defined in the Object Catalogue are reserved by this Standard.

The labels/codes 8193 to 16387 are reserved for further standardization.

Extensions to usage are permitted, however, redefinition or contradictory use of reserved labels/codes or acronyms is not permitted.

The use of non-Object Catalogue names and values may be further constrained by a product specification.

In all cases where this standard refers to the IHO Object catalogue, other data schema (catalogues) may be used instead, provided that the rules of this clause are adhered to".

19.   The mechanism described above defines the rules for possible S-57 extension, e.g. by river specific objects.

20.   First of all, Inland ECDIS Standard Section 2 shall be formulated as S-57 Product Specification: *Inland ENC Product Specification.*

21.   Then, it will be possible to try to make every effort to encode the features of an Inland ENC exchange set using the object classes, attributes, and attribute values identified in the IHO Object Catalogue.

22.   Where it will be impossible to use IHO Object Catalogue, the mechanism defined in S-57 shall be applied. In this case, it will be possible to prepare Product Specification complying with S-57 procedures.

23.   For the moment, the following comments may be made regarding the existing Inland ECDIS Standard's modifications of the IHO Object Catalogue.

Definitions

24.   New object classes and new attributes should have definitions as well as new attribute values. For example, the following Inland ECDIS objects and attributes have no definitions: *eleva1, comctn, clsdng, catnmk, fnctnm, catcom, catrfd, catwwm, clsdng.* Attribute value *clsdng = 3* (three blue lights/cones) also has no definition and it is impossible to understand where these lights/cones

will be exhibited. If they will be on the vessel, this is not a subject of cartography. Attribute value *catfry = 4* (swinging wire ferry) also has no definition. A lot of attributes values have no definition.

Copied object classes

25.   Copied object classes (19 object classes) were introduced into Inland ECDIS Standard in the cases when it was considered that new attribute values or new attributes are necessary to add. The following object classes were copied for this reason, but actually they can be represented by existent attributes or attribute values (to be discussed):

Anchorage berth – achbrt
Anchorage area – achare
Canal bank – canbnk
Depth area - depare
Distance mark – dismar
Restricted area - resare
River bank - rivbnk
Signal station traffic – sistat
Signal station warning - sistaw
Top Mark – topmar
Berth – berths
Bridge – bridge
Cable overhead - cblohd
Ferry route- feryrt
Harbour Area - hrbare
Harbour Facilities – hrbfac
Lock Basin – lokbsn
Radio calling-in point - rdocal
Navigational system of marks - m_nsys.

New object classes

26.   New object classes (16 object classes) were introduced into Inland ECDIS Standard for the reason that there are no similar object classes in IHO Object Catalogue. The following object classes can be represented by existent object classes of IHO Object Catalogue (to be discussed):

Notice mark – notmrk
Waterway axis - wtwaxs
Bridge area - brgare
Bunker station - bunsta
Communication Area - comare
Harbour Basin – hrbbsn
Lock area - lokare
Lock basin part – lkbspt
Port Area - prtare
Beacon water-way – bcnwtw
Buoy water-way – boywtw
Refuse dump – refdmp

Terminal – termnl
Turning basin – trnbsn

Copied attributes

27.   Copied attributes (10 attributes))were introduced when there were no enough values of the existent S-57 Object Catalogue values (to the Inland ECDIS Standard elaborators opinion). The values of attributes listed below can be presented by S-57 attributes (to be discussed):

Category of Anchorage area – catach
Category of distance mark – catdis
Category of signal station traffic - catsit
Category of signal station warning – catsiw
Restriction - restrn
Vertical datum – verdat
Category of bridge – catbrg
Category of ferry – catfry
Category of harbour facilities – cathaf
Marks navigational – System of - marsys

New attributes

28.   The 29 new attributes were introduced into Inland ECDIS Standard by different reasons. All new attribute introductions have to be discussed. To our opinion it is possible to represent all river specific information by means of S-57 attributes, without these new attributes and with no loss of data important to navigation.

Erroneous

29.   Inland ECDIS Standard contains some erroneous data that have to be discussed and corrected, as follows.

(i)   Object class *refdmp* contains attribute *catdmp*, but there is no such attribute in the Inland ECDIS Object Catalogue.

(ii)   Attribute acronym *bunvss* is written incorrectly. It has to be as *bunves*.

(iii)   New object class *wtwprf* (Waterway profile) is defined as "*A waterway profile is a physically non-existent line which is normally the connection of two opposite distance marks. Waterway profiles can be used to define a special water level*". This is not a cartographic object but a diagram. There is no cartographic symbol for its presentation. Any diagram can be represented in electronic chart by S-57 attribute *PICREP*.

(iv)   New object class *rtplpt* (Route planning point) is defined as "*A route planning point describes the projection of a feature object onto the waterway axis*". This is not a cartographic

object. This point is a matter of ECDIS and skipper during route planning. They create a special symbol during this work.

(v)   Copied attribute *catach* is expended with new values starting since *catach = 10*, but it should start from *catach = 11*.

(vi)   Copied attribute *catbrg* duplicates S-57 attribute *CATBRG*.

(vii)   New attribute *bunves* (Bunker vessel, availability) encodes " *The availability of a bunker vessel at a bunker station*" but it is not a cartographic information rather operational. There is no cartographic symbol for "availability". If this vessel encoded on the chart at the bunker station, it means that it is available and it is stationary. If this is a mobile object it is not a cartographic object.

(viii) New attribute *catccl* (Category of CEMT class) defines category of vessel or group of vessels, and it is not a cartographic object.

(ix)   New attribute *catrfd* (Category of refuse dump) has no reference with any object class, thus it is not necessary.

(x)   New attribute *horclw* (Horizontal clearance, width) duplicates S-57 attribute *HORWID* by definition. It should be pointed out whether they are different attributes or the same.

(xi)   New attribute *updmsg* (Update message) is not applicable and useless according to S-57 automatic and semiautomatic procedures. The same is for a new attribute *nupdms* (National update message).

D.   Conclusions

30.   After the examination of the Inland ECDIS Standard of CCNR, it became evident that the rectification of the standard is necessary. The divergence from the original maritime standards such as S-57 and S-52 should be brought to a minimum in order to facilitate the use of ECDIS for inland navigation and not to make the skipper to have several ECDIS on board the ship.

31.   The best way to edit Inland ECDIS Standard is to develop new appendix to S-57 for the river specific information and to submit this document to IHO for consideration. The new Inland ENC Product Specification will contain tables explaining how to interpret inland ENC information by means of S-57 facilities and some additions to IHO Object Catalogue and attributes if necessary.

E.   Proposal

32.   Taking into account the above-said, the delegation of the Russian Federation proposes to hold within the UNECE a thorough discussion on existing Inland ECDIS Standard and its possible rectification and formulate concrete recommendations for both the UNECE Working Party on Inland Water Transport and the International Expert Group on Inland ECDIS.

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