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Working Party on the Standardization of Technical and Safety Requirements in Inland Navigation

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Item 8 (b) of the provisional agenda

**Establishment of common principles and technical
requirements for Pan-European river information services (RIS)**

Resolution No. 48, “Recommendations on electronic chart display and information system for inland navigation (Inland ECDIS)”

Note by the secretariat

I. Mandate

1. At its fifty-first session, the Working Party on Inland Water Transport (SC.3) recognized that international expert groups continued their work on further developing technical standards for the river information services (RIS) and that the adoption of the SC.3 resolutions Nos. 48, 57, 60 and 63 was only a first step towards the creation of a harmonized framework for the river information services. To ensure proper maintenance of these recommendations, SC.3 asked the Working Party on the Standardization of Technical and Safety Requirements in Inland Navigation (SC.3/WP.3) to notify it of any developments that would make it necessary to amend the Resolutions in question (ECE/TRANS/SC.3/178, para. 27).

2. The secretariat has been informed by the Chair of the Recommendations on electronic chart display and information system for inland navigation (Inland ECDIS) Expert Group on the latest development of the Inland ECDIS standard, soon to be issued as its 2.3 edition. Edition 2.3 has been adopted by the expert group and has already been presented by the European Commission (EC) to the River Information Services (RIS) Committee of the European Union (EU). The Committee agreed with the proposal to use edition 2.3 for the Commission Regulation on Inland ECDIS within the framework of the Directive 2005/44/EC of the European Parliament and of the Council of 7 September 2005

on harmonized river information services (RIS) on inland waterways in the Community. The proposal will now go into the written procedure within the EU and should be published in the Official Journal in the second half of 2011.

3. The secretariat reproduces below the list of major differences between the envisaged edition 2.3 of the standard and the text of the United Nations Economic Commission for Europe (UNECE) Recommendations on Electronic Chart Display and Information System for Inland Navigation (annex to Resolution No. 48, first revised edition as set out in ECE/TRANS/SC.3/156/Rev.1).

4. The secretariat would like to draw the particular attention of the Working Party to the proposal of the Chair of the Inland ECDIS Expert Group on two options for maintaining the technical appendices on Product Specification for Inland Electronic Navigation Charts (ENCs) (Appendix 1) and Presentation Library for Inland ECDIS (Appendix 2). The proposal is presented in paragraphs 18 and 20.

5. Under option A, the amendment proposals will be submitted to the UNECE by the Chair of the expert group and the normal procedures for amending UNECE resolutions will apply. Under option B, the revocable mandate for appendices 1 and 2 will be conferred to the international Inland ENC Harmonization Group and the Inland ECDIS Expert Group, respectively. Option A (with references to EC and not UNECE) is currently contained in the Commission Regulation (EC) No. 414/2007 concerning the technical guidelines for the planning, implementation and operational use of RIS. Option B has been elaborated and recently accepted in the relevant regulations of the Central Commission for the Navigation of the Rhine (CCNR). The Inland ECDIS Expert Group considers that Option B would contribute to aligning the texts of the EC Regulation, the CCNR regulation and Resolution No. 48.

6. In considering this issue, the Working Party may wish to take into account the following elements:

(a) Product Specification for Inland ENCs (Appendix 1) and Presentation Library for Inland ECDIS are not issued by the secretariat as part of Resolution No. 48. This information is issued on the UNECE website in English and French, based on the text provided by the expert group;

(b) On the similar issue (Notices to skippers), the Working Party on Inland Water Transport recently agreed to replace technical standards (reference tables, the XML scheme for Notices to Skippers and the definition for all the XML elements) in its Resolution on "International Standards for Notices to Skippers and for Electronic Ship Reporting in Inland Navigation" (Resolution No. 60, ECE/TRANS/SC.3/175) with direct reference to the relevant technical documents maintained by the expert group on Notices to Skippers (ECE/TRANS/SC.3/187, para. 40).

7. Based on this information, the Working Party may wish to consider revising the annex to Resolution No. 48 with due regard to developments within the EU and River Commissions in this area.

II. Major modifications to the UNECE recommendation on Inland ECDIS standard, as set out in the annex to Resolution No. 48, appearing in the envisaged edition 2.3 of the standard

A. Preface

8. The text of the Preface is to be redrafted taking into account the present situation on the implementation of Maritime and Inland ECDIS within International Maritime Organization (IMO), International Hydrographic Organization (IHO), EU, UNECE, River Commissions and other international organizations concerned with the development of the standard.

B. Structure of the Inland ECDIS standard

9. Appendices A and B to Section 4 are renamed Sections 4A and 4B, respectively.

C. Comparison of the structures of the standard for (maritime) ECDIS and Inland ECDIS

10. The secretariat reproduces below a new comparison table from edition 2.3. It should be noted that in the text of the table as well as the new edition, standards, decisions and resolutions established within different ECDIS-related international organisms have been updated and need to be modified in the annex to resolution No. 48.

<i>(Maritime) ECDIS</i>	<i>Inland ECDIS</i>	<i>OPEN ECDIS FORUM</i> <i>http://ienc.openecdis.org</i>
IMO MSC.232(82) revised Performance Standards for ECDIS, December 2006	Section 1: Performance Standard	
Appendix 1: Reference Documents		
Appendix 2: SENC Information available for display during route planning and route monitoring		
Appendix 3: Navigational Elements and Parameters		
Appendix 4: Areas for which special conditions exist		
Appendix 5: Alarms and Indicators		
Appendix 6: Back-up requirements		
Appendix 7: RCDS mode of operation		
IHO S-57: Transfer Standard for Digital Hydrographic Data, Edition 3.1, Supplement No. 2, June 2009	Section 2: Data Standard for Inland ENCs	
Part 1: General Introduction		
Part 2: Theoretical Data Model		
Part 3: Data Structure		Inland ENC Feature Catalogue
Appendix A: IHO Object catalogue		
Introduction		
Chapter 1: Object Classes		
Chapter 2: Attributes		
Annex B: Attributes/Object Classes Cross Reference		Product Specification

<i>(Maritime) ECDIS</i>	<i>Inland ECDIS</i>	<i>OPEN ECDIS FORUM</i> <i>http://ienc.openecdis.org</i>
Appendix B: Product specifications Appendix B.1: ENC Product Specification Annex A: Use of The Object Catalogue for ENC Annex B: Example of CRC Coding Appendix B.2: IHO Object Catalogue Data Dictionary Product Specification	Section 2a: Codes for Producers and Waterways	for Inland ENCs IENC Encoding Guide OEF (www.openecdis.org): Codes for Producers and Waterways (not part of the Inland ECDIS technical specifications)
IHO S-62 ENC Producer Codes, Edition 2.5, December 2009	Section 3: Presentation Standard	Presentation Library for Inland ECDIS Look-up Tables Symbols Conditional Symbology Procedures
IHO S-52 Specification for Chart Content and Display Aspects of ECDIS, Edition 6, March 2010 Annex A: IHO ECDIS Presentation Library Annex B: Procedure for initial calibration of colour displays Annex C: Procedure for maintaining the calibration of displays Appendix 1: Guidance on Updating the Electronic Chart Annex A: Definitions and Acronyms Annex B: Current Updating Practice for Paper Charts Annex C: Estimate of Data Volume	Section 4: Operational and Performance Requirements, Methods of Testing and Required Test Results Section 4A: Measures to Ensure Software Quality Section 4B: System Configurations	
IEC 61174 Edition 3.0: ECDIS - Operational and Performance Requirements, Methods of Testing and Required Test Results, 2008-09	Section 5: Glossary of Terms	
S-32 Appendix 1: Hydrographic Dictionary – Glossary of ECDIS-Related Terms		

D. General remarks on the whole of the text of edition 2.3

11. Throughout the text of the edition 2.3:

(a) English modal verbs “must”, “should”, “will”, “has to”, “is to”, etc. are replaced by a conventional verb “shall”;

(b) The term “Inland ECDIS Standard” is replaced by “Technical specifications for Inland ECDIS”;

(c) Footnotes 3 to 9 made by the UNECE Working Party on Inland Water Transport to its Inland ECDIS standard as set out in the annex to Resolution No. 48 (exceptions allowed by Basin Administration on wide inland waterways) have not been introduced into the edition 2.3. The Working Party may wish to come back to this issue and decide accordingly.

12. The normative references and glossary of terms of edition 2.3 do not refer to UNECE or the Danube Commission or to any of their Inland ECDIS-related instruments (Inland ECDIS standard, radar requirements, etc.). Reference is made to the Central Commission for the Navigation of the Rhine (CCNR) and to its instruments.

E. Section 1: performance standard for Inland ECDIS

13. Section 5.1 “Information mode” is supplemented at the end with the following:

“The following time out values are recommended (from IEC 62388):

<i>Category of vessel</i>	<i>Nominal reporting interval</i>	<i>Maximum time out value</i>	<i>Nominal reporting interval</i>	<i>Maximum time out value</i>
	<i>class A</i>	<i>class A</i>	<i>class B</i>	<i>class B</i>
Vessel at anchor or moored and not moving faster than 3 knots (class B not moving faster than knots)	3 min	18 min	3 min	18 min
Vessel at anchor or moored and moving at more than 3 knots	10 s	60 s	3 min	18 min
Vessel operating in SOLAS mode, moving 0 to 14 knots	10 s	60 s	30 s	180 s
Vessel operating in SOLAS mode, moving 0 to 14 knots and changing course	3 1/3 s	60 s	30 s	180 s
Vessel operating in SOLAS mode, moving 14 to 23 knots	6 s	36 s	30 s	180 s
Vessel operating in SOLAS mode, moving 14 to 23 knots and changing course	2 s	36 s	30 s	180 s
Vessel operating in SOLAS mode, moving faster than	2 s	30 s	30 s	180 s

	<i>Nominal reporting interval</i>	<i>Maximum time out value</i>	<i>Nominal reporting interval</i>	<i>Maximum time out value</i>
<i>Category of vessel</i>	<i>class A</i>	<i>class A</i>	<i>class B</i>	<i>class B</i>
23 knots				
Vessel operating in SOLAS mode, moving faster than 23 knots and changing course	2 s	30 s	30 s	180 s
Vessel operating in inland waterway mode	2 – 10 s	60 s	-	-

The Automatic Identification System (AIS) targets shall be marked as outdated if the position information of moving vessels is older than 30 seconds.

Information on the intention (blue sign) or the number of blue cones of other vessels, the status of signals, weather warnings (European Multiservice Meteorological Awareness (EMMA) system) and the water level received via Inland AIS may be displayed. The information on the intention (blue sign) shall only be displayed on the right side of the symbol, if the heading of the vessel is available. If no heading information is available the information shall only be displayed in a direction independent form. The following table is providing an example for the display:

Visualisation of Blue Sign status 0 to 2 and dangerous goods							
Blue Sign		Not connected or not available		Not set		Set	
Blue cones		no	1 to 3	no	1 to 3	no	1 to 3
Heading	No						
	Symbol						
	True shape						
Yes							

14. Paragraphs (m) and (n) of Section 5.2 “Navigation mode” are modified to read:

- “(m) The presentation of the position and the orientation of other vessels by
- a directed triangle or
 - a true outline (to scale)

are permitted only if the heading of these other vessels is available. In all other cases a generic symbol shall be used (an octagon is recommended, a circle shall not be used for applications which are certified according to maritime standards).

(n) Information that another vessel is carrying blue cones or lights may be displayed by a different colour of the vessel symbol. The number of the blue cones/lights shall only be displayed in the pick report.

(o) Information on the intention of another vessel to pass on starboard (blue sign) may only be displayed on the right side of the directed triangle symbol or of the scaled shape if the heading of this vessel is available. If no heading information is available the information shall only be displayed in a direction independent form.

(p) Information regarding the position of AIS base stations, AIS Aids to Navigation (ATON) and AIS Search and Rescue Transmitters (SART) may be displayed, if the symbols can be distinguished from other symbols (e.g. symbols 2.10 and 2.11 of IEC 62288 Ed. 1, Table A.1)."

15. Subparagraph (b) of chapter 9 "Power supply in navigation mode" and chapter 10 "Maintenance" are deleted.

F. Section 2: data standard for Inland ENCs

16. Chapter 1 "Scope" is renamed "Introduction" and supplemented with:

"(e) This Data Standard comprises

- this Section 2
- Appendix 1 "Product Specification for Inland ENCs", Appendix 1.1 "Inland ENC Feature Catalogue" and Appendix 1.2 "Inland ENC Encoding Guide"."

17. The third article of chapter 4 "Product specifications", starting with words "The up-to-date Inland ENC...", etc. is deleted.

18. It is proposed to replace Chapter 6 "Maintenance" with a new chapter, "Procedures for changing of the appendices", containing one of the following options:

(a) Option A:

(i) Proposals for amendments of Appendix 1 "Product Specification for Inland ENCs" and its Appendices 1.1 and 1.2, "Inland ENC Feature Catalogue" and "Inland ENC Encoding Guide" shall be submitted at <http://ienc.openecdis.org>. They shall contain an explanation why the amendment is needed.

(ii) Proposals for amendments of Appendix 1.1 "Inland ENC Feature Catalogue" shall include a proposal for an amendment of Appendix 1.2 "Inland ENC Encoding Guide" with regard to the use of these amendments. Each new version of the Feature Catalogue for Inland ENC results in a new version of the Product Specification for Inland ENCs.

(iii) The Chair of the Inland ECDIS Expert Group shall inform UNECE accordingly.

(iv) As regards the Inland ECDIS Expert Group and the Inland ENC Harmonisation Group, the amendment procedure as defined in their respective Terms of Reference shall apply.

(v) The UNECE will proceed with the amendment in accordance with the relevant procedure. In this context, one shall take due account of the conclusions of the Inland ECDIS Expert Group and the Inland ENC Harmonization Group.

(vi) If a proposal for amendment is adopted, the relevant updated documents are uploaded at <http://ienc.openecdis.org>.

(b) Option B:

- (i) The maintenance procedure for the Product Specification for Inland ENC (including its annexes) is described in the Product Specification and its annexes.
- (ii) The International Inland ENC Harmonization Group (IEHG) has the revocable mandate to maintain the amendments of Appendix 1 “Product Specification for Inland ENCs” and its Appendices 1.1 and 1.2, “Inland ENC Feature Catalogue” and “Inland ENC Encoding Guide”. The mandate is subject to the following restrictions:
- (iii) Product Specifications for Inland ENCs:
1. IEHG is authorized to adapt this digital part of the Inland ECDIS Standard if the maintenance of the Inland ENC Feature Catalogue requires another version of the Product Specification for Inland ENCs.
 2. IEHG is authorized to adapt this digital part of the Inland ECDIS Standard in case of updating of the Product Specification for maritime ENCs, thus ensuring compatibility as far as possible.
- (iv) Inland ENC Feature Catalogue:
1. IEHG is authorized to amend this digital part of the Inland ECDIS Standard with additional entries.
 2. IEHG is not authorized to alter this digital part of the Inland ECDIS Standard by deleting existing entries if one veto against such a proposal arises.
- (v) Inland ENC Encoding Guide:
1. Concerning rules which describe the encoding of the minimum content of an Inland ENC (see 3.1 c of section 1 of this Standard):
 - IEHG is authorized to adapt this digital part of the Inland ECDIS Standard by amending those encoding rules with additional optional attributes.
 - IEHG is not authorized to adapt this digital part of the Inland ECDIS Standard by exchanging a currently used feature for another within those encoding rules if one veto against such a proposal arises.
 - IEHG is not authorized to adapt this digital part of the Inland ECDIS Standard by altering those encoding rules where attributes are characterized as “mandatory” or “conditional” if one veto against such a proposal arises.
 2. Concerning all other encoding rules:

IEHG is authorized to adapt this digital part of the Inland ECDIS Standard if necessary. If this means that other features and attributes shall be used in the future, the handling of the formerly used features and attributes depends on the decision on the entries within the Inland ENC Feature Catalogue.
- (vi) The Inland ECDIS Expert Group is authorized to correct factual errors within the Product Specification for Inland ENCs including the Inland ENC Feature Catalogue and the Inland ENC Encoding Guide.

(vii) IEHG is not authorized to adapt the Product Specification for Inland ENCs including the Inland ENC Feature Catalogue and the Inland ENC Encoding Guide for any other reasons than the abovementioned.

(viii) The maintenance procedure for the Product Specification for Inland ENC (including its annexes) shall ensure that the delegations of the member States have the same possibilities of access to the discussion of a proposal as any member of IEHG or the Inland ECDIS Expert Group.

(ix) The maintenance procedure for the Product Specification for Inland ENC (including its annexes) shall ensure that for every proposal the same discussion period applies. The discussion period shall not be shorter than six weeks.

G. Section 2: data standard for Inland ENCs

19. Waterways Codes in the file name of ENCs are modified as follows:

<i>Waterway Code</i>	<i>Waterway Name</i>	<i>Remark</i>
BA	Balaton	
BK	Boudewijn Kanaal	
BSK	Berlin-Spandauer Schiffahrtskanal	including Westhafenkanal and Charlottenburger Verbindungskanal
BZ	Beneden Zeeschelde	
D	Danube	including Sulina branch
DA	Danube Chilia branch	
DB	Dunarea Barcea	
DCC	Danube Cernovoda canal	
DE	Dortmund-Ems Kanal	
DD	Desna	
DN	Dnipro	
DNP	Prypiat	
DNS	Sula	
DNV	Vorskla	
DR	Drava	
DUK	Rackevei-Duna	
DUM	Mosoni-Duna	
DUS	Szenterei-Duna	
DV	Dunarea Veche	
EL	Elbe	
EH	Elbe-Havel-Kanal	

<i>Waterway Code</i>	<i>Waterway Name</i>	<i>Remark</i>
EMS	Ems	
ES	Elbe-Seiten-Kanal	
EV	Estuaire Vaart	Estuary shipping between Zeebrugge and Dutch border
GA	St. Gheorghe-Arm	
HO	Havel-Oder-Wasserstraße	including Westoder
KGT	Kanaal Gent-Terneuzen	
MA	Main	
MD	Main-Donau-Kanal	
ME	Müritz-Elde-Wasserstraße	
ML	Mittelland-Kanal	
MO	Mosel	
NE	Neckar	
NOK	Nord-Ostsee-Kanal	
OD	Oder	
OL	Olt	
PK	Plassendale Kanaal	
RH	Rhine	
RHK	Rhein-Herne-Kanal	
RL	Nederrijn/Lek	
RU	Ruhr	
SA	Sava	
SE	Schelde	
SI	Sio-chatorna	
SL	Saale	
SO	Spree-Oder-Wasserstraße	
SR	Saar	Currently SA is used; this will be changed to SR with the next edition
TI	Tisza	
UH	Untere Havel-Wasserstraße	
UWE	Unterweser	from km Uwe 0,00
WA	Waal	
WE	Mittelweser	until km 366,65/UWe 0,00

Additional waterway codes can be registered at <http://ienc.openecdis.org>.

H. Section 3: presentation standard for Inland ECDIS

20. It is proposed to replace Chapter 3 “Maintenance” with a new chapter, “Procedures for changing of the appendices”, containing one of the following options:

(a) Option A:

(i) Proposals for amendments to Appendix 2 “Presentation Library for Inland ECDIS” shall be submitted at <http://ienc.openecdis.org>.

(ii) They shall contain an explanation why the amendment is needed.

(iii) The procedure as described in Section 2, Chapter 6 applies in principle to changes to Appendix 2 “Presentation Library for Inland ECDIS”, with the difference that in this case the Inland ENC Harmonisation Group is not concerned.

(iv) The Chair of the Inland ECDIS Expert Group shall inform UNECE accordingly.

(v) As regards the Inland ECDIS Expert Group, the amendment procedure as defined in its Terms of Reference shall apply.

(vi) The UNECE will proceed with the amendment in accordance with the relevant procedures. In this context, one shall take due account of the work of the Inland ECDIS Expert Group.

(vii) If a proposal for amendment is adopted, the relevant updated documents are uploaded at <http://ienc.openecdis.org>.

(b) Option B:

(i) The maintenance procedure under No. 7 of the Product Specification for Inland ENC applies in principle to the maintenance of the Presentation Library too. In this case - unlike the described maintenance procedure - only the European Inland ECDIS Expert Group maintains the Presentation Library for Inland ECDIS.

(ii) The Inland ECDIS Expert Group has the revocable mandate to maintain the Presentation Library for Inland ECDIS including the Look-up Tables and the Symbols for Inland ECDIS. The mandate is subject to the following restrictions:

1. The Inland ECDIS Expert Group is authorized to adapt this digital part of the Inland ECDIS Standard if the introduction of new features, attributes or enumerations requires extensions.

2. The Inland ECDIS Expert Group is authorized to adapt this digital part of the Inland ECDIS Standard by altering existing symbols and the linked Look-up-Tables and Conditional Symbology Procedures. The Inland ECDIS Expert Group is not authorized to adapt this digital part of the Inland ECDIS Standard by altering existing symbols for floating and stationary aids-to-navigation (including notice marks) and the linked Look-up-Tables and Conditional Symbology Procedures if one veto against such a proposal arises.

3. The Inland ECDIS Expert Group is authorized to adapt this digital part of the Inland ECDIS Standard in case of updating of IHO’s Presentation Library for ECDIS, ensuring compatibility as far as possible.

4. The Inland ECDIS Expert Group is authorized to correct factual errors within Presentation Library for Inland ECDIS including the Look-up Tables and the Symbols for Inland ECDIS.

(iii) The Inland ECDIS Expert Group is not authorized to adapt the Presentation Library for Inland ECDIS including the Look-up Tables and the Symbols for Inland ECDIS for any other reasons than the above-mentioned.

(iv) The maintenance procedure for the Presentation Library for Inland ECDIS (including its annexes) shall ensure that the delegations of the member States have the same possibilities of access to the discussion of a proposal as any member of the Inland ECDIS Expert Group.

(v) The maintenance procedure for the Presentation Library for Inland ECDIS (including its annexes) shall ensure that for every proposal the same discussion period applies. The discussion period shall not be shorter than six weeks.

I. Section 4: Operational and Performance Requirements, Methods of Testing and Required Test Results

21. Section 1.2 “Normative references” is modified to read:

“

EN 60945 (2002):	Marine navigational equipment; General requirements - Methods of testing and required test results
IEC 61174 Edition 3.0:	ECDIS - Operational and performance requirements, methods of testing and required test results
ISO 9000 (2005):	Quality management and quality assurance standard
EU-Directive 2006/87/EC	Annex IX, Part III to VI: Requirements applicable to radar installations and rate-of-turn indicators
CCNR Decision 2008-II-11:	Amendments to the Police Regulations for the Rhine Navigation and to the Regulations for Inspection of Rhine Vessels concerning the minimum requirements and test conditions for navigation radar equipment and to the rate-of-turn indicators to be used for Rhine navigation and for their installation, with a view to adaptation to the European Directives concerning the electromagnetic compatibility and to international standards as well as the reorganization of the CCNR regulations, together with annexes 1 and 2 to this Resolution of 1.12.2009
EU-Directive 1999/5/EC	Radio Equipment and Telecommunications Terminal Equipment and the Mutual Recognition of their Conformity

“

22. Subparagraph (a) of Section 4.7 “Ranges/range rings” is supplemented at the end with a new line reading:

<u>“Range</u>	<u>Range rings</u>
4,000 m	800 m”

23. Second bullet point in subparagraph (e) of section 4.14 “Radar picture presentation and overlay” is modified to read:

“the age of information does not exceed the maximum time out values provided in the table in 5.1 (e) of section 1, Performance Standard for Inland ECDIS. The symbols shall be marked as outdated, if the age of the information exceeds 30 seconds for moving vessels. The position information of the own vessel shall not be displayed, if it is received from a repeater station.”

24. The word “a square” in subparagraph (g) of section 4.14 “Radar picture presentation and overlay” is replaced by “an octagon”.

25. Section 7.3 “Test of the displayed features” is supplemented with the text reading:

“If symbols that deviate from Appendix 2, the Inland ECDIS Presentation Library are used for the presentation of any chart information, then they shall:

- be legible;
- be certain and unambiguous in their meaning;
- be of sufficient size to support the nominal viewing distance.

Symbols added to the ECDIS Presentation Library shall be clearly distinguishable from Presentation Library symbols.”

26. Second bullet point in subparagraph (b) of 8.3.1 “Test of the radar overlay” is modified to read:

“the age of information does not exceed the maximum time out values provided in the table in 5.1 (e) of section 1, Performance Standard for Inland ECDIS. The symbols shall be marked as outdated, if the age of the information exceeds 30 seconds for moving vessels. The position information of the own vessel shall not be displayed, if it is received from a repeater station.”

J. Appendix A, “Measures to ensure software quality”

27. The word “APPENDIX A” in the title is replaced by “SECTION 4A”.

28. The third sentence of section 1.7 “Documentation requirements for users” is modified to read: “The user manual shall be available in English, French, German and Dutch”.

29. The second article under 2.1.2 “Sensor failure” is modified to read:

“If a critical sensor alarm signalizes, that position or heading does not meet the required accuracy, the navigation chart shall be switched off.”

30. The text of paragraph 2.1.3 is modified to read:

“A navigation system provider shall equip navigation systems during the compliance test with a standard NMEA interface sending the position and heading information used by the navigation system. This information shall be encoded by NMEA sentences known as GGA and HDT. Additional sentences like RMC, ROT and VTG are accepted.

These strings shall be sent preferably every 0.1 second, at least every second. Position and heading shall be according to the definitions in 2.1.1.1 and 2.1.1.2 of this Section.”

31. Chapter 4 “Maintenance” is deleted.

K. Appendix B, “System Configuration”

32. The word “APPENDIX B” in the title is replaced by “SECTION 4B”.

L. Section 5: glossary of terms

33. The terms 9 to 13 are deleted and replaced by the following:

“9. Annex IX, Parts III to VI, of EU-Directive 2006/87/EC: Requirements applicable to radar installations and rate-of-turn indicators.

10. Commission Regulation (EC) No. 414/2007 concerning the technical guidelines for the planning, implementation and operational use of river information services (RIS).

Definitions of the features and attributes can be derived from the Feature Catalogue for Inland ENC (Appendix 1.1 to these technical specifications).”

34. The last sentence of the definition of abbreviation “ECDIS” is deleted.

35. The definition of “IHO registry” is modified to read:

“IHO Geospatial Information Infrastructure Registry. A registry is the information system on which a register is maintained. In the case of S-100 IHO hosts a registry that provides a facility to store various registers of hydrographic-related information.”

36. A new abbreviation is inserted “(IHO-) S-32, App.1” defined as follows:

“Hydrographic Dictionary - Glossary of ECDIS Related Terms.”

37. The definition of “Inland ENC (IENC)” is modified to read:

“Inland Electronic Navigational Chart (IENC) means the database, standardized as to content, structure and format, for use with inland electronic chart display and information systems operated onboard of vessels transiting inland waterways. An IENC is issued by or on the authority of a competent government agency, and conforms to standards initially developed by the International Hydrographic Organization (IHO) and refined by the Inland ENC Harmonization Group. An IENC contains all the chart information necessary for safe navigation on inland waterways and may contain supplementary information in addition to that contained in the paper chart (e.g. sailing directions, machine-readable operating schedules, etc.) which may be considered necessary for safe navigation and voyage planning.”

38. Abbreviation “Inland ENC register” is replaced by “Inland ENC domain” defined as follows:

“Domain within the IHO Geospatial Information Infrastructure Registry dedicated for Inland ENC – related entries.”