



Conscious of the importance of the Sava River for the economic, social and cultural development of the region,

Desirous of development of the inland navigation on the Sava River,

Considering that the Directive 2005/44/EC of the European Parliament and of the Council of 7 September 2005 on harmonised river information services (RIS) on inland waterways in the community and Resolution No.48 of the UNECE on INLAND ECDIS, represent a set of guiding regulations with important role in inland navigation

Wishing to fully implement the harmonised Inland ECDIS (Electronic Chart Display and Information System) Standard to the navigation on the Sava river,

Believing that the development of electronic charts for inland navigation in Europe should be based on a harmonized standard to enable international transport to use charts of different countries with the same equipment of hardware and software,

In accordance with Article 16 Paragraph 1 (a) and 2 of the Framework Agreement of the Sava River Basin, the International Sava River Basin Commission (hereinafter: Sava Commission), on its V Regular Session held on January, 27-28, 2009, has adopted the following

DECISION - 04/09

on adoption of

INLAND ECDIS (Electronic Chart Display and Information System) STANDARD

1. Text of the Inland ECDIS (Electronic Chart Display and Information System) Standard is attached to this Decision as its integral part.
2. Parties shall adopt the measures necessary to implement this Decision and notify the Sava Commission.

3. This Decision shall be binding for the Parties unless any of the Sava Commission members withdraws his vote within 30 days after the decision has been adopted, or informs the Sava Commission that the Decision is subject to the approval of the relevant authority of his State.

If any of the Sava Commission members withdraws his vote within 30 days after the decision has been adopted, or informs the Sava Commission that the Decision is subject to the approval of the relevant authority of his State, the Sava Commission Secretariat shall, thereof, inform all other Sava Commission members.

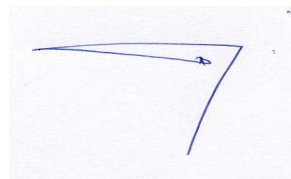
4. If no member withdraws his vote nor informs the Sava Commission that the Decision is subject to the approval of the relevant authority of his State, the Decision shall enter into force on February 28th 2009.
5. Upon entry into force, this Decision shall be binding in its entirety and directly applicable in the Parties.
6. The Sava Commission Secretariat shall notify the Parties of the entry into force of the Decision.

Ref. No: 1R-5-D-09-3/1-2

Zagreb, January 28, 2009

Mr. Branko Bačić

Chairman of the Sava Commission



INLAND ECDIS
(Electronic Chart Display and Information System)
STANDARD

Edition 2.0
23.11.2006

Standard
Electronic Chart Display and Information System
for Inland Navigation

Inland ECDIS

Content		Page
Section 1	Performance standard	1
Section 2	Data standard for Inland ENC's	13
Section 2a	Codes for producers and waterways	19
Section 3	Presentation standard	23
Section 4	Operational and performance requirements, methods of testing and required test results	31
	Appendix A Measures to ensure software quality	47
	Appendix B System configurations	55
Section 5	Glossary of terms	59

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Standard

Electronic Chart Display and Information System for Inland Navigation

Inland ECDIS

SECTION 1

Performance Standard for Inland ECDIS

Contents

1	Introduction (Primary Functions and Performance)	3
2	Definitions	3
2.1	Terms (see also section 5 of this Standard: Glossary)	3
2.2	References	4
3	Contents, Provision and Updating of Chart Information	4
3.1	Contents and Provision of Inland ENC's	4
3.2	Updates	5
4	Presentation of Information	6
4.1	Display Requirements	6
4.2	Display Ranges (Scales)	6
4.3	Image Positioning and Orientation	6
4.4	Display of SENC Information	6
4.5	Display of Radar Information	7
4.6	Display of Other Navigational Information	7
4.7	Colours and Symbols	8
4.8	Data and Display Accuracy	8
5	Operation	8
5.1	Information Mode	8
5.2	Navigation Mode	9
5.3	Operation and Control Elements	10
6	Connections with other Equipment	10
7	Indications and Alarms	10
7.1	Built in Test Equipment (BITE)	10
7.2	Malfunctions	10
8	Fallback Arrangements	10
8.1	Insufficient accuracy of the SENC-positioning	10
8.2	Defects	10
9	Power Supply in Navigation Mode	11

1 Introduction (Primary Functions and Performance)

- a) Inland ECDIS shall contribute to safety and efficiency of inland shipping and thereby to protection of the environment.
- b) Inland ECDIS shall reduce the navigational workload as compared to traditional navigation and information methods.
- c) Inland ECDIS (Operating System Software, Application Software and Hardware) shall have a high level of reliability and availability at least of the same level as other means of navigation, for the navigation mode as specified in Section 4 of this standard.
- d) Inland ECDIS can be designed for both, information mode and navigation mode, or for information mode only.
- e) Inland ECDIS shall use chart information as specified by Sections 2 and 3 of this Standard.
- f) Inland ECDIS shall facilitate simple and reliable updating of the Inland ENC.
- g) Inland ECDIS shall provide appropriate alarms or indications with respect to the information displayed or malfunction of the equipment.
- h) Inland ECDIS shall meet the requirements of this performance standard.

2 Definitions

2.1 Terms (see also section 5 of this Standard: Glossary)

For the Inland ECDIS performance standard the following definitions apply:

- a) **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.
- b) **Inland Electronic Navigational Chart (Inland ENC)** means the database, standardised as to content, structure and format, issued for use with Inland ECDIS. The Inland ENC complies with 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.
- c) **Inland System Electronic Navigational Chart (Inland SENC)** means a database, resulting from the transformation of the Inland ENC by Inland ECDIS, for appropriate use, updates to the Inland ENC by appropriate means and other data added by the skipper. It is this database that is actually accessed by the Inland ECDIS for display generation and other navigational functions. The Inland SENC may also contain information from other sources.
- d) **Minimum Information Density (display base)** means the minimum amount of SENC information that is presented and which cannot be reduced by the operator, consisting of information that is required at all times in all geographic areas and under all circumstances.

- e) **Standard Information Density (standard display)** means the default amount of SENC information that shall be visible when the chart is first displayed on Inland ECDIS first.
- f) **All Information Density (all display)** means the maximum amount of SENC information. Here, in addition to the standard display, also all other features are displayed, individually on demand.
- g) **User-defined settings** means the possibility to use and store a profile of display and operation controls-settings.
- h) **Integrated Display** means a head-up, relative-motion picture consisting of the SENC overlaid with the radar-image with matching scale, offset and orientation.
- i) **Navigation Mode** means the use of the Inland ECDIS for conning the vessel with overlaid radar image.
- j) **Information Mode** means the use of the Inland ECDIS for information purposes only without overlaid radar image.

2.2 References

- a) IHO Special Publication No. S-57 "IHO Transfer Standard for Digital Hydrographic Data", Edition 3.1, November 2000
- b) IHO Special Publication No. S-62 "ENC Producer Codes", Edition 2.2, March 2006
- c) IHO Special Publication No. S-52 "Specifications for Chart Content and Display Aspects of ECDIS", 5th Edition, December 1996, including
 - S-52 Appendix 1 "Guidance on Updating the Electronic Chart", 3rd Edition, July 1997,
 - S-52 Appendix 2 "Colour and Symbols Specifications for ECDIS", Edition 4.2, March 2004 and
 - S-52 Appendix 3 "Glossary of ECDIS-related Terms", 3rd Edition, December 1997
- d) IMO Resolution A.817(19) "Performance Standards for Electronic Chart Display and Information Systems (ECDIS)", November 1995
- e) IEC-Guideline 1174 "ECDIS -- Operational and performance requirements, methods of testing and required test results", December 1996
- f) ZKR-Beschlüsse 1989-II-33, -34 und -35 (Vorschriften betreffend die Mindestanforderungen, die Prüfbedingungen, den Einbau und die Funktionsprüfung von Navigationsradaranlagen und Wendeanzeigern in der Rheinschifffahrt, Fassungen vom 1.1.2004)

3 Contents, Provision and Updating of Chart Information

3.1 Contents and Provision of Inland ENCs

- a) The chart information to be used in Inland ECDIS shall be the latest edition of information.
- b) Provisions shall be made to prevent the user from altering the contents of original Inland ENC editions.

- c) If the chart is intended to be used for navigation mode (Ch. 5.2), at least the following features shall be included in the ENC:
- bank of waterway (at mean water level)
 - shoreline construction (e.g. groyne, longitudinal control dam, training wall – any facility that is considered a hazard to navigation)
 - contours of locks and dams
 - boundaries of the fairway / navigation channel (if defined)
 - isolated dangers in the fairway / navigation channel under water
 - isolated dangers in the fairway / navigation channel above water level, such as bridges, overhead cables etc.
 - Official aids-to-navigation (e.g. buoys, beacons, lights, notice marks)
 - waterway axis with kilometres and hectometres or miles
- d) If the chart is intended to be used for navigation mode (ch 5.2), the respective competent authority decides for each waterway or harbour within its geographical responsibility which of the above named features are to be verified. (Recommendation: The whole minimum content of an Inland ENC should be verified.) The respective competent authority shall declare which Inland ENCs are appropriate to navigation mode within its geographical responsibility. (For details see section 2a of this Standard.)

3.2 Updates

- a) Inland ECDIS shall be capable of accepting updates to the Inland ENC data provided in conformity with the agreed standards. These updates shall be applied to the SENC automatically. The implementation procedure shall not interfere with the display in use.
- b) Inland ECDIS shall allow display of updates, so that the skipper may review their contents and ascertain that they have been included in the SENC.
- c) Inland ECDIS shall be capable of revoking automatically applied updates of the Inland ENC data.
- d) Original Inland ENC editions and later updates shall never be merged.
- e) The Inland ENC and all updates to it shall be displayed without any degradation of their information content.
- f) The Inland ENC data and updates to it shall be clearly distinguishable from other information.
- g) Inland ECDIS shall ensure that the Inland ENC and all updates to it have been correctly loaded into the SENC.
- h) Inland ECDIS shall keep a record of updates, including the time of application to the SENC.
- i) The contents of the SENC to be used shall be adequate and up to date for the intended voyage.

4 Presentation of Information

4.1 Display Requirements

- a) The display method shall ensure that the displayed information is clearly visible to more than one observer in the typical conditions of light experienced in the wheelhouse of a vessel by day and night.
- b) The display size of the chart presentation shall be at least 270 mm by 270 mm for equipment designed and admitted for the Navigation Mode. In Information Mode ergonomic aspects shall determine the size.
- c) The display requirements shall be met whether in landscape or in portrait format.

4.2 Display Ranges (Scales)

- a) In Information Mode (ref. to Ch. 5.1), it is recommended to use the same ranges as specified in the Navigation Mode.
- b) In Navigation Mode (ref. to Ch. 5.2), only the successive switchable ranges (scales) specified in Section 4, ch. 4.7 of this Standard are allowed.

4.3 Image Positioning and Orientation

- a) In Information Mode all kinds of chart orientation are allowed (see Ch. 5.1)
- b) In Navigation Mode the chart shall be automatically positioned and oriented in the relative motion, head-up orientation with the own ship's position in the screen centre or off-centred (see Ch. 5.2).

4.4 Display of SENC Information

- a) The display of SENC information shall be divided into the following three display categories:

- Display Base
- Standard Display
- All Display

The membership of the feature classes in the display categories is given in detail in the Look-up Tables of IHO S-52, Appendix 2, Annex A (Presentation Library) and in the "Presentation Library for Inland ECDIS" (see Look-up Tables), which is published at <http://ienc.openecd.org>.

- b) The Display Base category has to contain at least the following features:

- bank of waterway (at mean water level)
- shoreline construction (e.g. groyne, longitudinal control dam, training wall – any facility that is considered a hazard to navigation)
- contours of locks and dams
- boundaries of the fairway / navigation channel (if defined)
- isolated dangers in the fairway / navigation channel under water

- isolated dangers in the fairway / navigation channel above water level, such as bridges, overhead wires etc.
 - Official aids-to-navigation (e.g. buoys, lights and beacons)
- c) The Standard Display category has to contain at least the following features:
- the objects of Display Base category
 - prohibited and restricted areas
 - piers for commercial vessels (cargo and passenger)
 - kilometre and hectometre or mile marks on the banks
- d) The All Information Display category has to display all features that are contained in the Inland SENC, individually on demand.
- e) When invoking the Inland ECDIS, it shall come up with the Standard Information Density at an appropriate range available in the SENC for the displayed area
- f) Inland ECDIS shall be switchable to the Standard Information Density at any time by a single operator action.
- g) Inland ECDIS shall clearly indicate the information density currently in use at all times.
- h) Time variable depth information in the ENC has to be displayed independently of the above named three display categories.

4.5 Display of Radar Information

- a) In Navigation Mode the radar image shall have the highest display priority and it is only allowed to be presented in the relative motion, head-up mode. If the system is also type approved for maritime ECDIS, true motion and north-up mode may be implemented. If such a system is used in true motion and/or north-up mode on European inland waterways, it is considered to be working in Information Mode.
- b) The under laid SENC shall match in position, range and orientation. The radar image and the position from the position sensor shall both be adjustable for the antenna offset to the conning position.
- c) The overlaid radar image has to conform to the minimum requirements as specified in Section 4, ch. 4.14 of this Standard.
- d) The overlaid radar-image may contain additional navigational information. Any additional navigational information and tracking and tracing symbols should however in no way degrade the display of the original radar content.

4.6 Display of Other Navigational Information

- a) Inland ECDIS and additional navigational information shall use a common reference system.
- b) It shall be possible to display the skipper's own ship's position on the screen.
- c) It shall be possible for the skipper to select safety limits.
- d) Inland ECDIS shall emphasize the falling short of the safety limits.

4.7 Colours and Symbols

- a) The display of colours and symbols to represent SENC information shall at least be able to comply with the regulations of Section 3 of this Standard. Additionally other user-selectable symbol sets are allowed.
- b) To present navigational elements and parameters as listed in the IMO Resolution A.817(19), Appendix 3 other colours and symbols than those mentioned in 4.7.a must be used.

4.8 Data and Display Accuracy

- a) The accuracy of the calculated data that are presented shall be independent of the display characteristics and shall be consistent with the SENC accuracy.
- b) The Inland ECDIS shall provide an indication whether the display uses a smaller display range than the accuracy of the Inland ENC data offers (over-scale indication).
- c) The accuracy of all calculations performed by Inland ECDIS shall be independent of the characteristics of the output device and shall be consistent with the SENC accuracy.
- d) Bearings and distances drawn on the display or those measured between features already drawn on the display shall have an accuracy no less than that afforded by the resolution of the display.

5 Operation

5.1 Information Mode

- a) Information Mode is intended to be used for information only and not for navigation.
- b) In Information Mode all kinds of chart orientation, rotation, zooming and panning are allowed. However, it is recommended to use the same fixed ranges as in the Navigation Mode and the chart orientation either
 - to north, or
 - to the fairway axis at the actual position, or
 - to the actual ships-heading.
- c) It should be possible to scroll the chart manually on the screen with the fairway axis in line with the vertical screen axis.
- d) Inland ECDIS may be connected to a positioning sensor to scroll the chart picture automatically and to display the section of chart matching the actual surrounding, namely in the operator-selected range.
- e) It is recommended to only display information regarding the position and orientation of other vessels, gathered by communication links like AIS or AI-IP, if they are up-to-date (nearly real-time) and accurate. The presentation of the position and the orientation of other vessels by
 - a directed triangle or
 - a true outline (to scale)are strongly discouraged if the heading of these other vessels is not available. A generic symbol is recommended.

5.2 Navigation Mode

- a) In Navigation Mode, the Inland ECDIS display shall be integrated with the own ship's radar information. The radar information shall be clearly distinguishable from the SENC information.
- b) The integrated display must be in accordance with the requirements for radar on inland waterways as specified in Section 4, ch. 4.14 of this Standard.
- c) The chart and the radar image must match in size, position and orientation within the limits as specified in Section 4, ch. 3.4 and 8.3.2 of this Standard.
- d) The Integrated Display shall only be presented in the head-up orientation. Other orientations are permitted in systems with an additional maritime ECDIS type approval. If such a system is used in true motion and/or north-up mode on European inland waterways, it is considered to be working in Information Mode.
- e) It shall be possible for the operator to adjust the displayed position of the vessel so that the radar image matches the SENC display.
- f) It shall be possible to remove either the ECDIS or the radar information by a single operator action temporarily.
- g) The vessel's position shall be derived from a continuous positioning system of which the accuracy is consistent with the requirements of safe navigation.
- h) Navigation Mode must provide an indication when the input from the position-fixing system is lost. Navigation Mode shall also repeat, but only as an indication, any alarm or indication passed to it from a position fixing system.
- i) The positioning system and the SENC shall be based on the same geodetic datum.
- j) In navigation mode, the data according to ch. 3.1.c of this standard shall always be visible and shall not be obscured by other objects.
- k) Information regarding the position and orientation of other vessels, gathered by other communication links than the own radar, are permitted to be displayed only if they are up-to-date (nearly real-time) and meet the accuracy that is required for the support of tactical and operational navigation.
- l) As tracking and tracing information (for example AIS) of other vessels is useful for the planning of the passing, but of no use during passing itself, T&T (AIS) symbols shall not disturb the radar image during passing and shall be faded out therefore. Preferably the application should allow the skipper to define the area where the symbol is faded out.
- 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 (a square is recommended, a circle should be used for inland applications only).

5.3 Operation and Control Elements

- a) Inland ECDIS shall be designed following ergonomic principles for user-friendly operation.
- b) The Inland ECDIS equipment shall have a minimum of operation and control elements (see Section 4).
- c) Operation and control elements, and indicators for connected sensors, may be integrated in Inland ECDIS.
- d) Standard settings and user-defined settings shall be retrievable easily.

6 Connections with other Equipment

- a) Inland ECDIS shall not affect the performance of any connected equipment adversely. Similarly the connection of optional equipment shall not degrade the performance of Inland ECDIS.
- b) Inland ECDIS shall be capable of generating information to other systems, e.g. for the purpose of electronic reporting.
- c) The relevant requirements of controls and indicators to connected equipment shall be fulfilled.

7 Indications and Alarms

7.1 Built in Test Equipment (BITE)

Inland ECDIS shall be provided with means for carrying out on board tests of major functions either automatically or manually. In case of a failure, the module at fault shall be shown.

7.2 Malfunctions

Inland ECDIS shall provide a suitable alarm or indication of system malfunctions (ref. to Section 4, ch. 9).

8 Fallback Arrangements

8.1 Insufficient accuracy of the SENC-positioning

In Navigation Mode the SENC shall be automatically switched off, if the SENC positioning does not match the radar picture within the limits of Section 4, ch. 5.1 and 5.2.

8.2 Defects

- a) If the Inland ECDIS system has an evident defect, it shall provide a suitable alarm (ref. to Section 4, ch. 4.16 and 9 of this Standard).
- b) Facilities enabling a safe take-over of the Inland ECDIS functions shall be provided in order to ensure that an Inland ECDIS failure does not result in a critical situation.

9 Power Supply in Navigation Mode

- a) The Inland ECDIS shall have its own separate fused power supply.
- b) Interruptions of the power supply for a period up to 5 minutes shall not have any influence on correct operation and shall not require restarting of the equipment manually.

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Standard

**Electronic Chart Display and Information System
for Inland Navigation**

Inland ECDIS

SECTION 2

Data Standard for Inland ENC's

Contents

1.	Scope	15
2.	Theoretical data model	15
3.	Data Structure	15
4.	Product Specification	15
5.	Definitions	16

Data Standard

1. Scope

This "Data Standard for Inland ENC's" describes the standard to be used

- for the exchange of digital hydrographic data between national inland waterway authorities and
- for its distribution to manufacturers, skippers and other users.

This Data Standard shall be used for the production of Inland ENC's. The transfer and distribution has to take place in such a way that none of the information is lost.

This Data Standard is based on the "IHO Transfer Standard for Digital Hydrographic Data", Special Publication No. 57, Edition 3.1 with all Appendices and Annexes (see comparison table in the preface of this Inland ECDIS Standard), in brief "S-57".

This Data Standard describes the necessary additions and clarifications to S-57 and the application of S-57 for the purpose of use in Inland ECDIS applications.

2. Theoretical data model

The description of the theoretical data model as contained in S-57 Part 2 applies to the theoretical data model of Inland ENC's without any changes or amendments.

3. Data Structure

The description of the data structure as contained in S-57 Part 3 applies to the data structure of Inland ENC's without any changes or amendments.

4. Product Specification

The Inland ENC Product Specification is a set of specifications intended to enable chart producers to produce a consistent Inland ENC, and manufacturers to use that data efficiently in an Inland ECDIS that satisfies the Performance Standard for Inland ECDIS (Section 1).

An Inland ENC must be produced in accordance with the rules defined in this Specification and must be encoded using:

- the Inland ENC Feature Catalogue and
- the rules described in the Inland ENC Encoding Guide.

The up-to-date Inland ENC Product Specification and its annexes are published at <http://ienc.openecdis.org>. The Appendix of this standard is containing the status quo of the Inland ENC Product Specification and its annexes at the moment of adoption of this edition of the standard.

Official Inland ENCs have to be produced in accordance with the latest version of the standard and the Product Specification at <http://ienc.openecdis.org>. Official Inland ENCs, which have been produced in accordance with Edition 1.02 of the Inland ECDIS Standard (also published at <http://ienc.openecdis.org>) before the enter into force of this standard remain valid until new editions are published in accordance with Edition 2.0.

5. Definitions

Definitions of terms may be found in

- S-57, part 1, clause 5
- the "Glossary of ECDIS Related Terms" in Appendix 3 to S-52
- the "Glossary of Terms" in Section 5 of this standard.

Edition 2.0
23.11.2006

Standard

Electronic Chart Display and Information System for Inland Navigation

Inland ECDIS

SECTION 2a

Inland ECDIS Data Standard

Codes for Producers and Waterways

In addition to

IHO-S-62 ENC Producer Codes

Codes for producers of Inland ENC's as well as the registration procedure are published at www.openecdiss.org.

If administrations or private companies decide to produce Inland ENC's, they shall register a producer code at the "Open ECDIS Forum" at www.openecdiss.org, if they aren't already mentioned in IHO S-62.

Since a producer code alone is not sufficient in order to judge whether an Inland ENC is appropriate to navigation mode the following declaration process shall apply:

1. The respective competent authority for a waterway or a harbour shall register itself on the official websites of the organizations which have adopted this Standard. Details on the name of the authority, its geographical responsibility, its official website and other communication possibilities shall be given and shall be accessible on this website.
2. The respective competent authority for a waterway or a harbour shall maintain a list of Inland ENC's which are appropriate to navigation mode within its geographical responsibility. The list shall include the file name of the cell, which stretch of the inland waterway is covered, the edition number, the issue date and a list of available updates files to the currently valid edition, also with their issue dates. By putting an Inland ENC on that list the authority declares this cell as verified concerning the minimum content and therefore appropriate to navigation mode.

The lists of competent authorities for waterways or harbours with the abovementioned details on the official websites of the organizations which have adopted this Standard are regarded as digital parts of the Inland ECDIS Standard and are named "Competent authorities and geographical responsibilities".

The following Codes for Waterways are recommended for use in the file name of IENCs:

Waterway Name	Waterway Code	Remark
Danube	D	(with Sulina branch)
Danube	DA	Chilia branch
Danube	DCC	Cernavoda canal
Neckar	NE	
Main	MA	
Mosel	MO	
Elbe	EL	
Rhine	RH	
Nederrijn / Lek	RL	
Waal	WA	
Drava	DR	
Tisza	TI	
Sava	SA	
Dunarea Veche	DV	
Dunarea Barcea	DB	
Sf. Gheorghe-Arm	GA	
Olt	OL	
Sio-chatorna	SI	
Balaton	BA	
Danube	DUM	Mosoni-Duna
Danube	DUS	Szenterei-Duna
Danube	DUK	Rackevei-Duna

Additional waterway codes can be registered via the "Open ECDIS Forum" at www.openecd.org.

Edition 2.0
23.11.2006

Standard

Electronic Chart Display and Information System for Inland Navigation

Inland ECDIS

SECTION 3

Presentation Standard for Inland ECDIS

Contents

1.	Introduction	25
2.	Introduction to the Presentation Library for Inland ECDIS	26
2.1	Components of S-52 and Inland ECDIS Presentation Library	26
2.2	Look-up tables	27
2.3	Conditional symbology procedures (CS)	27
2.4	Colours	28
2.5	Presentation of notice marks	28

1. Introduction

1. This "Presentation Standard for Inland ECDIS" describes the standard to be used for the presentation of Inland ECDIS data. The presentation has to take place in such a way that none of the information is lost.
2. This Presentation Standard is based on the document "S-52, Specification for Chart Content and Display Aspects of ECDIS" of the IHO, Edition 5.0 of December 1996, with all Appendices and Annexes (see "Comparison of the structures of the standards for (Maritime) ECDIS and Inland ECDIS" in the preface of this Standard for Inland ECDIS).
3. This Presentation Standard describes the necessary additions and clarifications to S-52 and the application of S-52 for the purpose of use in Inland ECDIS applications.
4. This Presentation Standard is organized as follows:
 - this section 3 of the Inland ECDIS Standard,
 - the "Presentation Library for Inland ECDIS" which is published at <http://ienc.openecdms.org> with additions and clarifications to be applied to S-52, Appendix 2, Annex A.
5. Definitions of terms may be found in
 - IHO-S-57, Part 1, clause 5,
 - the "Glossary of ECDIS-Related Terms" in Appendix 3 to S-52,
 - the "Glossary for Inland ECDIS" in Section 5 of this Inland ECDIS Standard.

2. Introduction to the Presentation Library for Inland ECDIS

S-57 data sets do not contain any information about how it is going to be presented. The chart presentation is generated online in the Inland ECDIS application. For that purpose, the Inland ECDIS application uses machine-readable symbolization instructions for each feature, which is drawn on the screen. For the presentation of ENC's the IHO S-52 standard is mandatory. The S-52 standard contains all rules which are necessary for the symbolization and presentation of ENC's on the screen.

Since the features, attributes and attribute values for ENC's were extended for Inland ENC's an extension of the S-52 standard is necessary as well in order to be able to display also the Inland specific features. All extensions apply to the Edition 3.3 of the IHO ECDIS Presentation Library (Annex A of Appendix 2 of S-52).

2.1 Components of S-52 and Inland ECDIS Presentation Library

The major components of the S-52 presentation library are:

- A library of symbols, line styles and fill styles
- A colour coding scheme which includes the IHO colour tables for day, dusk and night time
- A set of symbology command words from which machine readable instructions can be assembled. The result is a symbology instruction, which is processed to symbolise ENC features in turn.
- A set of conditional symbology procedures to decide the appropriate symbolisation in cases determined by the mariner's selection (e.g. safety contour) or for complex symbols (e. g. top marks on buoys and beacons)
- A set of look-up tables that link feature descriptions from the ENC to the appropriate symbology instructions depending on whether:
 - a. the link is straight forward, i.e. a direct relationship between an feature's description and its presentation such as a buoy or a land area. In this case, the look-up table provides the symbology instruction to show a symbol, an area fill, or a line style.
 - b. the link is conditional, i.e. depending on circumstances, for example a depth area, whose colour fill depends on the choice of the safety contour. In this case the look-up table refers the decision to a conditional symbology procedure that selects the appropriate symbology instructions later.

Inland ECDIS uses all S-52 components plus extensions in:

- Lookup tables
- Symbol library
- Conditional symbology procedures

Only the extensions are described in the Presentation Library for Inland ECDIS at <http://ienc.openECDIS.org>.

2.2 Look-up tables

For each geometry type (point, line, area) there is a separate look-up table. Each entry in a look-up table consists of the following fields:

1. 6-character code of the feature class (acronym)
2. Attribute combination
3. Symbolization instructions
4. Display priority, 0-9 (comparable with drawing layers)
5. Radar code
6. Display category (Display base, standard, all other)
7. "Viewing group", more refined grouping of features than the display categories

```
"LNDMRK","CATLMK17|","SY(TOWERS01)","7","O","OTHER","32250"
```

Figure 1 - Example entry of a look-up table

In this case the feature LNDMRK is shown by the symbol TOWERS01 with priority 7, if the attribute CATLMK equals 17. The feature lies over the radar.

The presentation of features in a specific area that are contained in different cells of the same usage follows the entries in the look-up tables.

The Inland ECDIS Presentation Library provides five look-up tables:

- paper chart point symbols
- simplified point symbols
- line symbols
- plain area boundary symbols
- symbolized area boundary symbols

The lookup tables are supplied in digital form at <http://ienc.openecdis.org>.

2.3 Conditional symbology procedures (CS)

CS are generated for features of which the symbolization

- depends on application settings, e.g. safety contour,
- depends on other features, e.g. top marks and their structure,
- is too complex to be defined in a direct look-up table entry.

CS Procedures, which have to be modified or implemented in an Inland ECDIS additional to the CS Procedures of S-52 are published at <http://ienc.openecdis.org>.

2.4 Colours

Colours used in an ECDIS are defined in an absolute, monitor independent way (CIE coordinates). This ensures that ECDIS charts look similar on monitors of different suppliers. By means of a colour calibration software which must be used by the manufacturer, CIE values are converted into RGB values.

Commercial displays usual in the trade are seen as matching this requirements.

Because of the different lighting conditions on the bridge of a ship, it is necessary to offer presentations with different brightness. For each level a separate colour table exists.

The represented colour scheme shall be chosen on the basis of ergonomically and physiological factors and the representation of indications in different colours shall not result in mixed colours by superimposing.

2.5 Presentation of notice marks

Notice marks which are located at the river bank are presented in the chart displayed by generic symbols (notmrk01, notmrk02 and notmrk03). This does not apply to the notice marks on bridges.

Additionally applications are required to be able to display the detailed symbol, which is similar to the real world indication, and the full set of object information of a user-selected notice mark.

Notice marks that are located at bridges, shall be symbolized according to the orientation of the bridge.

Notice marks which specify distances or a velocity will not be symbolized with the number itself, but only with that symbol which gives the general regulation or information.

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Standard

Electronic Chart Display and Information System for Inland Navigation

Inland ECDIS

SECTION 4

Operational and Performance Requirements, Methods of Testing and Required Test Results

Contents

1	Introduction	34
1.1	Scope of this document.....	34
1.2	Normative references.....	34
2	Operating modes and system configuration.....	34
2.1	Operating modes.....	34
2.2	System configurations.....	35
3	Performance requirements	35
3.1	Hardware performance	35
3.2	Software performance.....	35
3.3	Performance of operation controls.....	36
3.4	Display performance	36
4	Operational functions.....	37
4.1	Operating mode	37
4.2	Equipment pre-sets (store/recall).....	37
4.3	Presentation of SENC information	37
4.4	Chart orientation, positioning and shifting.....	38
4.5	Position and bearing of the own ship	38
4.6	Information density.....	38
4.7	Ranges/Range rings	38
4.8	Picture Brilliance	39
4.9	Picture colours	39
4.10	Pick report	39
4.11	Measuring features	39
4.12	Input and editing of skippers' own chart entries.....	39
4.13	Loading and updating of SENC's.....	39
4.14	Radar picture presentation and overlay.....	40
4.15	Inland ECDIS functions with immediate access	40
4.16	Permanent visible function parameters.....	40
5	Service functions	41
5.1	Static correction of the chart position.....	41
5.2	Static correction of the chart orientation	41
5.3	Configuration of interfaces	41
6	Hardware test and required certificates	41
6.1	Compatibility with the environmental requirements	42
6.2	Equipment documentation	42
6.3	Interfaces	42
6.4	Characteristic of operation controls	42
6.5	Characteristic of the display	42
7	Test of the chart presentation, operation and functionality	42
7.1	Preparation of the Equipment Under Test (EUT).....	42
7.2	Test of the operation modes	42

7.3	Test of the displayed features	43
7.4	Test of the scale dependent information density (SCAMIN).....	43
7.5	Test of brilliance variation	43
7.6	Test of the colours.....	43
7.7	Test of the measurement functions.....	43
7.8	Test of the chart update function	43
7.9	Test of displayed features in more than one cell of the same usage for the same area	44
8	Test of radar picture presentation and operation.....	44
8.1	Preparations.....	44
8.2	Test of the radar picture without overlaid chart	44
8.3	Test of the radar picture, overlaid information from other vessels and the underlying chart..	44
9	Test of alarms and indications	46
10	Test of fall back arrangements	46

Appendices:

- A Measures to Ensure Software Quality**
- B System Configurations (Figures)**

1. Introduction

1.1 Scope of this document

This section 4 of the Inland ECDIS Standard specifies the minimum requirements contained in section 1 and describes the test procedures and the required results concerning the hardware, the software, the functions, the operation, the display and the interfaces to other equipment on board of ships.

1.2 Normative references

References to the following normative documents are made in this document in addition to the references in section 1, ch. 2.2 of this standard:

EN 60945 (1997):	Marine navigational equipment; General requirements - Methods of testing and required test results
IEC 1174:	ECDIS - Operational and performance requirements, methods of testing and required test results
ISO 9000 (1987):	Quality management and quality assurance standard
CCNR Decision 1989-II-33:	Standard on the minimum requirements and on the required test results for navigational radar equipment in the Rhine navigation
CCNR Decision 1989-II-34:	Standard on the minimum requirements and on the required test results for rate-of-turn indicators in the Rhine navigation
CCNR Decision 1989-II-35:	Standard on the installation and on functional tests of navigational radar equipment and of rate-of-turn indicators in the Rhine navigation
EU-Directive 1999/5/EC:	Radio Equipment and Telecommunications Terminal Equipment and the Mutual Recognition of their Conformity

2. Operating modes and system configuration

2.1 Operating modes

- a) The Inland ECDIS Standard distinguishes two operating modes: **navigation mode** and **information mode**.
- b) Inland ECDIS equipment designed for operating in **navigation mode** has to fulfil the requirements of this standard and the standards on navigational radar equipment and rate-of-turn indicators to be proven by conformity tests.
- c) For Inland ECDIS equipment designed for **information mode** only, the requirements of this section 4 are to be understood as a recommendation.

2.2 System configurations

2.2.1 Inland ECDIS equipment, stand-alone-system without connection to radar

In this configuration only operation in **information mode** is possible (see Appendix B, Fig. 1).

2.2.2 Inland ECDIS equipment, parallel installation and connection to radar

This configuration allows operation in **information mode** as well as in **navigation mode** (see Appendix B, Fig. 2).

2.2.3 Inland ECDIS equipment, monitor shared with connected radar equipment

In special cases, it is possible to share one display for the Inland ECDIS equipment and for the radar equipment. The prerequisite for this is a monitor with matching graphic parameters for both video signals, and a video switch, which allows a fast switchover of the video sources, and – if needed - a mechanical rotation of the display to the required orientation (see Appendix B, Fig. 3).

This configuration allows operation in **information mode** as well as in **navigation mode**

2.2.4 Radar equipment with integrated Inland ECDIS functionality

This is a radar installation with integrated Inland ECDIS functionality that can be operated in **information mode** as well as in **navigation mode** (see Appendix B, Fig. 4).

3. Performance requirements

3.1 Hardware performance

- a) Inland ECDIS equipment shall be designed and manufactured to withstand typical environmental conditions prevailing on board of a vessel without any degradation in quality and reliability. Furthermore, it shall not disturb other communication and navigation equipment.
- b) In the configuration as described in paragraph 2.2.4 all components of inland ECDIS equipment, installed inside the wheelhouse, shall fulfil the requirements of the class b) "protected from weather" equipment as specified in the standard EN 60945 with the exception that the test temperature range is limited to 0° C to +40° C (whereas the test temperature range in EN 60945 is specified from – 15° C to + 55° C) unless specified differently in this document. For the configurations described in paragraph 2.2.2 and 2.2.3 CE conformity is sufficient.

3.2 Software performance

Operation, visualisation, and functionality of Inland ECDIS equipment are usually realised by software. Taking this into account, the software shall be designed, developed, implemented, and tested according to the generally accepted state of the art. Therefore, the manufacturer shall fulfil the software requirements described in Appendix A to this document.

3.3 Performance of operation controls

- a) The operation of the system shall be simple, appropriate and conform to common human interface standards.
- b) The number of operational controls shall be as low as possible and restricted to the required number.
- c) Wireless remote controls are not admitted.
- d) The ON/OFF switch is to perform and to be arranged in such a way that inadvertent operation is not possible.
- e) The symbols of the operating controls need a minimum character height of 4 mm and have to be readable under all conditions that may exist in a wheelhouse.
- f) The brilliance and the illumination of the operating controls should be adjustable to the required value.

3.4 Display performance

3.4.1 Display dimensions

In **navigation mode** the minimum chart and radar display area is 270 mm x 270 mm.

3.4.2 Display orientation

- a) A rectangular display may be mounted in landscape or in portrait orientation under the prerequisite that the above-mentioned minimum dimensions are fulfilled.
- b) Because of the limited space available in the typical wheelhouse of an inland vessel and the fact that a vessel usually follows the fairway-axis, the display shall be installed preferably in the portrait orientation.

3.4.3 Display resolution

A display resolution of 5 m in the 1,200 m range is required. This leads to a maximum pixel dimension of 2.5 m x 2.5 m, i.e. about 1,000 pixels at the short edge of the display.

3.4.4 Display colours

The system shall be able to display ergonomically proven colour combinations for day and night.

3.4.5 Display brilliance

The brilliance of the display shall be adjustable to every operational required value. This is especially valid for the lowest value during operation at night.

3.4.6 Picture renewal

- a) The picture renewal rate shall not be shorter than that of the radar picture (≥ 24 pictures per minute).
- b) Between two consecutive renewals no fluctuations of brilliance may occur.
- c) On raster scan displays, the frame repetition rate may not be lower than 60 Hz.

3.4.7 Display technology

Preferably such display systems shall be used that are insensitive to the magnetic fields that may occur in the wheelhouse of an inland vessel.

4. Operational functions

4.1 Operating mode

- a) If the equipment is able to work in both operation modes it shall provide the possibility to switch between **navigation mode** and **information mode**.
- b) The operation mode in use shall be displayed.
- c) Suitable measures are required to prevent inadvertent switching off of the **navigation mode**.

4.2 Equipment pre-sets (store/recall)

- a) After invoking, the Inland ECDIS equipment shall come up with a moderate brilliance pre-set which neither blinds in a dark environment nor makes the picture invisible in a bright environment.
- b) Other parameters may come up with their values at the time before switching off or from stored settings.

4.3 Presentation of SENC information

SENC = System Electronic Navigational Chart

- a) The radar picture shall be clearly distinguishable from the chart independently of the chosen colour table.
- b) Only a monochrome presentation of the actual radar picture is permitted.
- c) The presentation of chart information shall not mask or degrade important parts of the radar picture. This has to be ensured by appropriate entries into the look-up tables (ref. to section 3 of this standard, clause 2.2, field "radar code").
- d) In **navigation mode**, chart and radar picture presentation shall have the same scale.
- e) The heading line must be always visible.
- f) Additionally, the mariner's own ship's contour and the safety contours may be inserted.

4.4 Chart orientation, positioning and shifting

- a) In **navigation mode**, only the chart orientation "relative motion, head up" and the "centred" or "off centred" presentations, as required for the radar picture, are permitted.
- b) In **information mode**, at least the chart orientations north and parallel to the waterway axis as well as positioning are recommended. By connection of a positioning sensor, the displayed part of the chart can automatically follow the mariner's own ship's position.

4.5 Position and bearing of the own ship

- a) In **navigation mode**, the own ships position shall always be visible in the display area, whether "centred" or "off centred" as specified in the CCNR radar requirements.
- b) The heading line, which runs from the display centre to the top and which always shall be visible, shall represent the heading of the mariner's own ship.

4.6 Information density

The information density shall be at least adjustable to the three switch steps: "Minimum", "Standard" and "All Information". The latter displays all other features in addition to the "Standard" display, individually on demand. All corresponding visible features are defined in the "Performance Standard" and the "Presentation Standard" (-> "Presentation Library for Inland ECDIS") (Sections 1 and 3 of the Inland ECDIS Standard).

4.7 Ranges/Range rings

- a) In **navigation mode** the following fixed ranges and range rings are prescribed according to the radar regulations:

Range	Range rings
500 m	100 m
800 m	200 m
1.200 m	200 m
1.600 m	400 m
2.000 m	400 m

- b) Both, smaller as well as larger ranges with a minimum of four and a maximum of six range rings are permitted.
- c) Inland ECDIS equipment in **navigation mode** shall have fixed range rings with the above-mentioned intervals and at least one variable range marker (VRM).
- d) Switching on/off of fixed and variable range markers shall be independent of each other and their display has to be clearly distinguishable.
- e) The position of the VRM and the corresponding displayed distance shall use the same increments and resolution.
- f) The functions of the VRM and the electronic bearing line (EBL) may additionally be realised by a cursor and by a corresponding numerical display, showing range and bearing of the cursor position.
- g) For **information mode** the same ranges are recommended.

4.8 Picture Brilliance

- a) The brightness of the display shall be adjustable to the operationally necessary value. This applies in particular to operation in darkness.
- b) Chart and radar picture require separate brightness controls.
- c) Because of the strongly different environment brightness of bright day and dark night, another control for the basic brightness of the display shall be available additionally to the colour tables in the menu.

4.9 Picture colours

At least the colour combinations included in the IHO-S-52 Presentation Library, ch. 4 and 13 (*colour tables*) for bright day, white-back day, black-back day, dusk and night shall be supported.

4.10 Pick report

- a) In **navigation** mode, it shall be possible to get all underlying textual and/or graphical information concerning user selections of the features that are displayed in the chart.
- b) This additional textual and/or graphical information shall not hamper the view of the waterway in the navigational chart.

4.11 Measuring features

- a) Measuring features for distances and bearings are required.
- b) Resolution and accuracy shall at least be the same as those of the display, but may not suggest better values than those of the chart data.

4.12 Input and editing of skippers' own chart entries

- a) Inland ECDIS equipment shall allow input, storing, modifying, and deletion of additional chart information by the skipper (*skippers' own features*).
- b) These own chart entries shall be distinguishable from the SENC data, and may not overlay or degrade the radar picture.

4.13 Loading and updating of SENC's

- a) All **manual** activities concerning loading or updating of charts shall be possible only outside the navigation mode.
- b) **Automatic** updating shall not downgrade the performance of the navigation display.
- c) A **rollback function** has to be implemented to allow restoring to the last working combination.

4.14 Radar picture presentation and overlay

- a) The radar image representation is mandatory for operation in the navigation mode.
- b) The dimensions, resolution and attributes of the radar presentation shall fulfil the relevant radar requirements.
- c) The radar picture must not be degraded by other contents of the picture (see clause 4.3.c)
- d) Provided the functional requirements are fulfilled, overlaying of different information layers is permitted.
- e) The overlay of information regarding the position and orientation of other vessels is only allowed when:
 - the information is up-to-date (nearly real-time) and
 - the age of the information does not exceed 5 seconds
- f) The overlaid information derived from tracking and tracing devices regarding the position and orientation of other vessels shall be faded out at a user-definable range.
- g) 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 (a square is recommended, a circle should be used for inland applications only).
- h) It shall be possible to switch off the chart and any other information layer and to display only the radar picture by one easily accessible control element or menu area.
- i) If the quality and plausibility monitors of the Inland ECDIS equipment detect that the chart cannot be oriented and/or positioned with the accuracy required by this document, an alarm shall be presented on the display and the chart shall be switched off automatically.

4.15 Inland ECDIS functions with immediate access

- a) The following operational functions require direct access:
 - RANGE
 - BRILLIANCE
 - COLOURS
 - INFORMATION DENSITY
- b) These functions need either own control elements or own menu areas, which are arranged in the highest menu level and are permanently visible.

4.16 Permanent visible function parameters

The following function parameter shall be always visible:

- actual RANGE
- sensor STATUS (radar tuning, position quality, alarms)

- selected WATER LEVEL (if available)
- selected SAFETY DEPTH (if available)
- selected INFORMATION DENSITY

5. Service functions

Service functions have to be protected by password or other suitable measures against unauthorised access and shall not be selectable in navigation mode.

5.1 Static correction of the chart position

- a) The position of the mariner's own ship shall be presented "centred" or "off centred" on the display in accordance with the radar requirements. The chart position shall match the radar image. Assuming an absolute position's input the permissible static difference between actual radar position and displayed radar centre shall not exceed 1 m.
- b) It shall be possible to correct an offset error (distance between the positions of the position sensor and the radar sensor).

5.2 Static correction of the chart orientation

- a) The difference between the heading line orientation and the ship's axis shall not be greater than ± 1.0 deg.
- b) Chart and radar image shall have the same orientation. The static directional error between heading line and chart orientation shall be less than ± 0.5 deg.

5.3 Configuration of interfaces

- a) It shall be possible to configure interfaces for connected sensors, actors and signals (*An actor transforms an electrical quantity into another physical quantity (e.g. optical). An actor is the opposite of a sensor*).
- b) Interfaces shall comply with existing interface specifications like the NMEA 01/83 standard and the interface specifications for rate of turn indicators (20 mV/deg/min).

6. Hardware test and required certificates

- a) The test consists of a comparison between the equipment under test (EUT) and the requirements of this document.
- b) Proved equivalent tests, and proved and documented test results will be accepted without renewed tests.

6.1 Compatibility with the environmental requirements

- a) Inland ECDIS equipment, as described in paragraph 2.2.4, shall fulfil the requirements of the Standard EN 60 945 concerning the environmental conditions (humidity, vibration and temperature; the latter reduced according to chapter 3.1 of this document) and concerning electromagnetic compatibility.
- b) The provider or his representative is obliged to submit a relevant conformity declaration of an accredited laboratory.

6.2 Equipment documentation

The technical documentation will be checked to be complete, appropriate, and understandable, and to be sufficient for unproblematic installation, configuration and operation of the equipment.

6.3 Interfaces

- a) All interfaces shall be documented correctly and completely.
- b) Electronic Circuits need to be designed failsafe, mechanically as well as electronically, and may not have degrading repercussions on connected equipment.

6.4 Characteristic of operation controls

All operation controls will be checked regarding the ergonomic and functional mode of operation and shall fulfil the requirements of this document.

6.5 Characteristic of the display

The display shall fulfil all requirements of this document concerning dimension, displayable colours, resolution, and variation of brilliance.

7. Test of the chart presentation, operation and functionality

7.1 Preparation of the Equipment Under Test (EUT)

The EUT will be installed, assembled and connected according to the installation manual. After switching on the test SENC will be loaded.

7.2 Test of the operation modes

All operating modes as described in the operating manual will be successively invoked and tested. The requirements of chapter 4 shall be fulfilled.

7.3 Test of the displayed features

Whether all features included in the test SENC are visible and correctly displayed will be tested. For this test, the information density will be switched to "all features". The system shall be capable to at least display all features according to the "Presentation Standard for Inland ECDIS" (Section 3 of the Inland ECDIS Standard). Additionally other user-selectable symbol sets are allowed.

7.4 Test of the scale dependent information density (SCAMIN)

- a) Whether the SCAMIN functionality (*the minimum scale at which the feature may be used for ECDIS presentation*) is installed correctly will be tested.
- b) For this test, the range will be used at which the feature shall be visible according to its SCAMIN enumeration (ref. to the IHO-S-57 Attribute Catalogue and the IHO-S-52 Users Manual to the Presentation Library, ch. 8.4).

7.5 Test of brilliance variation

The Inland ECDIS equipment will be operated in a dark room and the brilliance will be brought to its lowest level. The brilliance of the features shall not exceed a value of 15 cd/m², and the background a value of 0,5 cd/m².

7.6 Test of the colours

All user selectable S-52 colour tables will be sequentially tested to conform to this document.

7.7 Test of the measurement functions

- a) All numeric displayed values of the electronic bearing line (EBL) and the variable range marker (VRM) shall exactly match with the analogue positions of the EBL and the VRM (or correspond with the cursor co-ordinates).
- b) The resolution and increments of the numerical display shall be identical with the analogue values of EBL and VRM.

7.8 Test of the chart update function

- a) Before and after every test step the version numbers of the loaded SENCs and updates will be recalled as described in the operation manual and showed on the display.
 - Step 1: Loading of the test SENC,
 - Step 2: Update of the test SENC,
 - Step 3: Test of the roll-back function,
 - Step 4: Loading of a new SENC.

After an update it should be possible to recall and display all concerning features.

7.9 Test of displayed features in more than one cell of the same usage for the same area

It will be tested whether all features included in the test SENC and in the additional overlay test SENC are visible and correctly displayed. For this test the information density will be switched to "all features". It will be tested whether it is possible to select one or more specific cells for presentation if there are several cells from different producers for the same area with the same usage.

8. Test of radar picture presentation and operation

8.1 Preparations

- a) For the test purposes, the manufacturer or provider has to provide a serial interface at the system to be approved (*Equipment under test* - EUT) which delivers the same actual values (as NMEA 01/83 strings) of position and heading that are used to position and orient the chart.
- b) During the test, a reference system will be used of which position and heading values are compared with those of the EUT.
- c) The EUT will be connected to any type approved radar equipment (to the choice of the provider).
- d) The radar picture will be adjusted in range and bearing with reference to the heading line.

8.2 Test of the radar picture without overlaid chart

- a) If the Inland ECDIS equipment displays the radar picture but the radar operation control remains at the radar equipment (App. B, figures 2 and 3), the radar picture of the inland ECDIS equipment will be considered as the "daughter display" of an item of radar equipment. In that case, the radar picture has to fulfil the display and picture-relevant requirements of the requirements for radar and rate-of-turn indicators.
- b) If the EUT is a radar installation with integrated Inland ECDIS functionality (Appendix B, figure 4), all requirements of the standards for radar equipment and rate-of-turn indicators have to be fulfilled.

8.3 Test of the radar picture, overlaid information from other vessels and the underlying chart

The Inland ECDIS equipment will be installed in a reference environment. This can be real (on a ship) or simulated. Position and orientation information of other vessels (conform the Inland AIS standard) will be applied with several information ages.

8.3.1 Test of the radar overlay

- a) The radar image shall not be degraded by the chart picture (ref. to ch. 4.3.c).
- b) The overlay of information regarding the position and orientation of other vessels is only displayed when:
 - the information is up-to-date (nearly real-time) and

- the age of the information does not exceed 5 seconds
- c) The overlay of information derived from tracking and tracing devices regarding the position and orientation of other vessels is faded out at a user-definable range.
- d) The position and the orientation of other vessels by
- a directed triangle or
 - a true outline (to scale)
- is displayed only when the heading of these other vessels is available. For all other vessels a generic symbol is used (a square is recommended, a circle should be used for inland applications only).
- e) It is possible to switch off the chart and any other information layer and to display only the radar picture by one easily accessible control element or menu area.
- f) The chart picture shall be renewed not later than the radar picture.

8.3.2 Test of the chart positioning and orientation

- a) The static offset of the chart position shall be less than ± 5 m in all ranges up to 2,000 m.
- b) The static azimuth orientation offset error between radar and chart image shall be less than $\pm 0,5$ deg.
- c) The correction of these parameters shall be demonstrated in the service mode.
- d) The dynamic deviation of the chart orientation at rates of turn less than ± 60 deg./min shall be less than ± 3 deg.
- e) These tests will be performed visually or by evaluation of measured data.

8.3.3 Test of scale conformity

The chart's information will be compared with well-known reference points contained in the radar picture in order to test whether the chart scale sufficiently conforms to the radar scale.

9. Test of alarms and indications

- a) The alarms generated from Inland ECDIS equipment itself as well as the passed alarms delivered by the connected sensors to the ECDIS will be tested.
- b) The test procedure comprises the following situations:
 - any error in the Inland ECDIS equipment (built-in test equipment - BITE),
 - missing positioning signal,
 - missing radar signal,
 - missing rate of turn signal,
 - missing heading signal,
 - radar map matching not possible,

10. Test of fall back arrangements

- a) This test shall demonstrate the reaction of the Inland ECDIS equipment to a failure of any internal or external component and the possible and required actions by the operator.
- b) In addition, the operating manual will be checked to determine whether the measures required by the operator are described adequately and appropriately.

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Electronic Chart Display and Information System for Inland Navigation

Inland ECDIS

SECTION 4

**Operational and Performance Requirements,
Methods of Testing and required Test Results**

Appendix A

Measures to Ensure Software Quality

Contents

1	General requirements	49
1.1	Software design requirements	49
1.2	Implementation requirements	49
1.3	Test requirements	50
1.4	Third party components requirements	50
1.5	Requirements for additional services in navigation mode	50
1.6	Language	50
1.7	Documentation requirements for users.....	50
2	Methods of testing and required results	51
2.1	Navigation mode operation test	51
2.2	General software tests	53
3	Changes to certified systems	53
3.1	General requirements	53
3.2	Hardware and software changes	54

1. General requirements

Software used in navigation mode is assumed to be a safety-relevant part of a navigation system. Providers of navigation systems have to make sure that all software components used in navigation mode allow secure navigation in every situation.

1.1 Software design requirements

Software components have to be clearly designed by means of established software design methods. The design specification must indicate how safety requirements are addressed in the software design. A software style guide has to be provided that specifies code writing style, documentation style, modularization, conflict analyses and testing of software components. For every software component documents describing specification and design are required.

1.2 Implementation requirements

Implementation of software modules has to be done by qualified developers, fully understanding the design and safety requirements.

If more than one developer is working on the navigation system software, a version control system has to be used that guarantees conflict-free development.

The implementation has to be according to the design specification and has to reflect the software style guide. Moreover, well known implementation problems (depending on the language used) have to be addressed in the implementation. This includes but is not restricted to:

- null pointer handling,
- uninitialised variables,
- range checking,
- array size verification,
- memory allocation and de-allocation,
- exception handling.

If parallel processing is used (e.g. multiple threads, tasks or processes) problems of conflict-free processing have to be addressed in the implementation. This includes but is not restricted to:

- race conditions,
- re-entrance problems,
- priority inversion,
- deadlocks.

1.3 Test requirements

In accordance with the design specification, software modules have to be tested. The test results have to be compared with the design guidelines and documented in test reports.

Tests have to incorporate module as well as system tests. Providers of a navigation system have to use extensive simulator-based tests to ensure stability of their system. The simulator must allow the simulation of a complete navigation environment including all required external sensors.

1.4 Third party components requirements

Third party components (OEM products, OEM means original equipment manufacturer) include software not developed by the navigation system provider. This includes but is not restricted to

- static or dynamic linked libraries,
- computer aided design and engineering tools producing source or object code,
- operating systems.

Third party software components have to be chosen according to the general safety requirements. The navigation system provider has to prove that third party components meet the high standards necessary for safe navigation either by providing acceptable quality certificates or by extensive and provable testing of the components.

1.5 Requirements for additional services in navigation mode

Navigation systems may support additional services in navigation mode if they are useful. These services must not interfere with navigation mode.

The navigation system provider is responsible for additional test equipment, necessary to verify interface specification, protocol specification and compliance tests with the Inland ECDIS standard.

1.6 Language

Additional national versions of a type-approved Inland ECDIS shall reapply for type approval to be checked for the translation of the user interface.

1.7 Documentation requirements for users

The documentation (manuals) has to contain comprehensive information on installation, operation and service of the navigation system. The presentation of user-relevant information shall be made clear, understandable and without unnecessary technical terms. The user manual shall be available in the official CCNR languages. The technical documentation may be made available in English only.

2. Methods of testing and required results

2.1 Navigation mode operation test

2.1.1 Performance requirements

Navigation systems must make reliable estimations of position and heading. Moreover, the estimation of position and heading has to be checked by the system for conformity with the required accuracy.

Position and heading information has to be calculated and displayed for the same reference position. This should normally be the centre of the radar antenna. A new position estimate must at least be available with every revolution of the radar antenna.

2.1.1.1 Position

The navigation system has to estimate and display the position of the ship. The following minimal requirements have to be fulfilled under normal operation conditions:

- a) The average position estimation shall not deviate more than 5 meters from the true position and shall cover all systematic errors.
- b) The standard deviation σ has to be less than 5 meters and shall be based on random errors only.
- c) The system shall be capable to detect deviations of more than 3σ within 30 seconds.

These results have to be verified by a realistic test of at least 60 min.

2.1.1.2 Heading

The navigation system has to estimate and display the heading of the ship.

The following minimal requirements have to be fulfilled:

- a) The average heading angle estimation shall not deviate more than 1 degree from the radar heading direction and shall cover all systematic errors. The offset between ship heading direction and radar heading shall be less than 1 degree.
- b) The standard deviation σ has to be less than 2 degrees and shall be only based on random errors.

These results have to be verified by a realistic test of at least 60 min.

2.1.2 Sensor failure

Navigation systems have to check proper operation of the position and heading estimation online. Problems have to be detected within 30 seconds. In case of malfunction, the navigation system has to inform the user about the problem and its consequence for navigation.

If reliable navigation is not possible the navigation chart should not be displayed.

2.1.3 Performance test interface

A navigation system provider has to 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 has to be encoded by NMEA sentences known as GGA and PAT.

Example: GGA - Global Position System Fix Data

```
$GPGGA,123519,4807.038,N,01131.324,E,1,08,0.9,545.4,M,46.9,M, , *42<CR><LF>
```

123519	Fix taken at 12:35:19 UTC. (This field has to provide the time of the position estimation.)
4807.038,N	Latitude 48 deg 07.38' N (This field has to provide the latitude of the fix.)
01131.324,E	Longitude 11 deg 31.324' E (This field has to provide the longitude of the fix.)
1	Fix quality (0 = invalid, 1 = GPS fix, 2 = DGPS fix (This field can have any valid value.)
08	Number of satellites being tracked. (This field can have any valid value.)
0.9	Horizontal dilution of position (This field can have any valid value.)
545.4,M	Altitude, Metres, above mean sea level. (This field is can have any valid value.)
46.9,M	Height of geoid (mean sea level) above WGS 84 ellipsoid. (This field can have any valid value.)
(empty field)	Time in seconds since last DGPS update. (This field can have any valid value.)
(empty field)	DGPS station ID number. (This field can have any valid value.)

Example: PAT - Position and altitude message (Ashtech proprietary position and altitude message.)

```
$GPPAT,223924.0,3922.2871,N,12159.4503,W,+/-00253.2,121.673,+/-002.59, +/-004.61,.....  
...0.0031, 0.0205, 0<CR><LF>
```

223924.0	UTC of position. (This field has to provide the time of the position estimation.)
3922.2871,N	Latitude 39 deg 22.2871' N (This field has to provide the Latitude of the fix.)
12159.4503,W	Longitude 121 deg 59.4503' W (This field has to provide the Longitude of the fix.)
+/-00253.2	Altitude in meters. (This field can have any valid value.)
121.673	Heading in degrees. (This field has to provide the heading angle use by the navigation system.)
+/-002.59	Pitch in degrees. (This field can have any valid value.)
+/-004.61	Roll in degrees. (This field can have any valid value.)
0.0031	Attitude phase measurement error MRMS (meters). (This field can have any valid value.)
0.0205	Attitude baseline length rms error, BRMS (meters). (This field can have any valid value.)
0	Attitude reset flag ((0: good attitude, 1: rough estimate or bad attitude). (This field can have any valid value.)

Both strings have to be sent over the same NMEA interface at least every second. The position and heading have to be according to the definitions in section 2.1.1.1 and section 2.1.1.2 of this Appendix.

2.2 General software tests

2.2.1 Equipment documentation

The following documents have to be provided for admittance and have to be shipped with every navigation system:

- Users manual,
- Installation manual,
- Service manual.

The following documents and files have to be provided during the admittance procedure and are not required for end users:

- design specification,
- software style guide,
- certificates of third party software components or test and simulation protocols.

The documents and files provided must allow a complete verification of compliance with the Inland ECDIS standard.

2.2.2 Endurance test

The navigation system must pass an endurance test of 48 hours of uninterrupted operation under normal operation conditions. The system has to provide standard interfaces for performance and resource monitoring during operation. Monitoring the system must show no indication of system instability, memory leaking or any kind of performance loss over time. Navigation systems supporting additional services while running in navigation mode provide the necessary test equipment including all documents mentioned in chapter 1.7 of this Appendix.

3. Changes to certified systems

3.1 General requirements

Navigation systems installed on board must be functionally equivalent to a system certified by authorities. For every system the navigation system provider must ship a statement of compliance with the Inland ECDIS standard and its functional equivalence to the certified system.

The competent authority is entitled to check Inland ECDIS compliance of installed systems at any time.

3.2 Hardware and software changes

The navigation system provider can change software or hardware as long as Inland ECDIS compliance is maintained. Changes have to be fully documented and submitted to the competent authority together with an explanation of how the navigation system is affected by these changes. The competent authority can require a partial or complete renewal of certification if considered necessary. The aforementioned also applies to the use of an approved Inland ECDIS with another national version of the operating system.

The following changes do not affect certification of the system and require only a notice to the competent authority:

- minor changes on third party components (e.g. operation system or library updates),
- use of equivalent or better hardware components (e.g. faster microprocessor, newer chip revisions, equivalent graphic card etc.),
- minor changes in source code or documentation.

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23.11.2006

Standard

Electronic Chart Display and Information System for Inland Navigation

Inland ECDIS

SECTION 4

Operational and Performance Requirements, Methods of Testing and Required Test Results

Appendix B

System Configurations

Figures

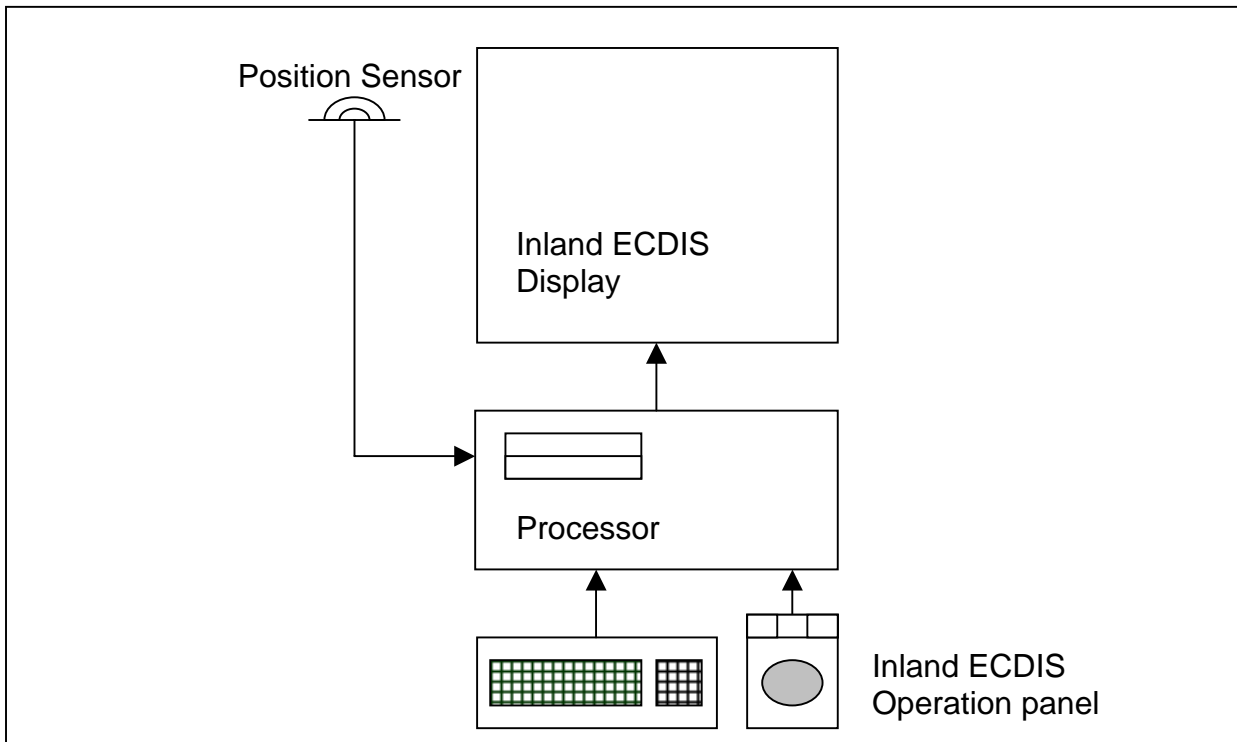


Fig. 1: Inland ECDIS equipment, self-sufficient system without connection to radar

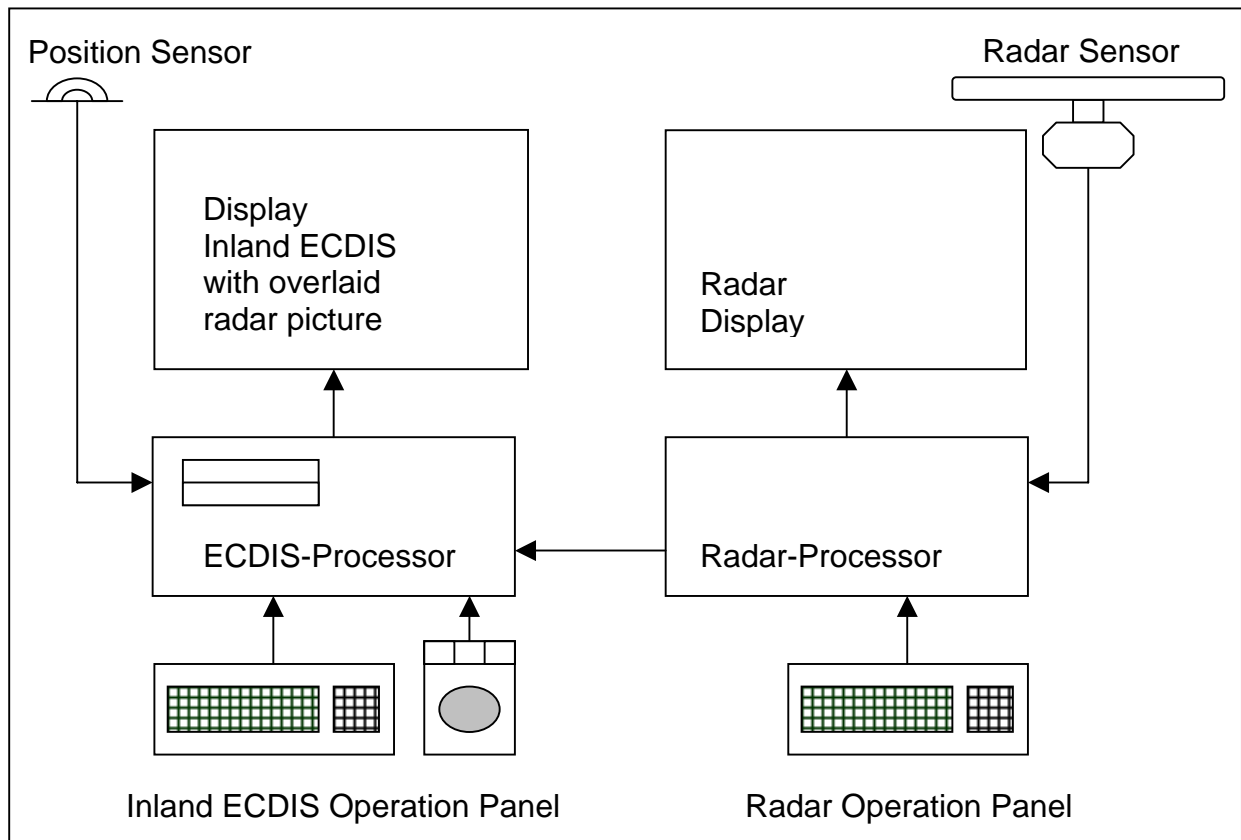


Fig. 2: Inland ECDIS equipment, self-sufficient system with connection to radar

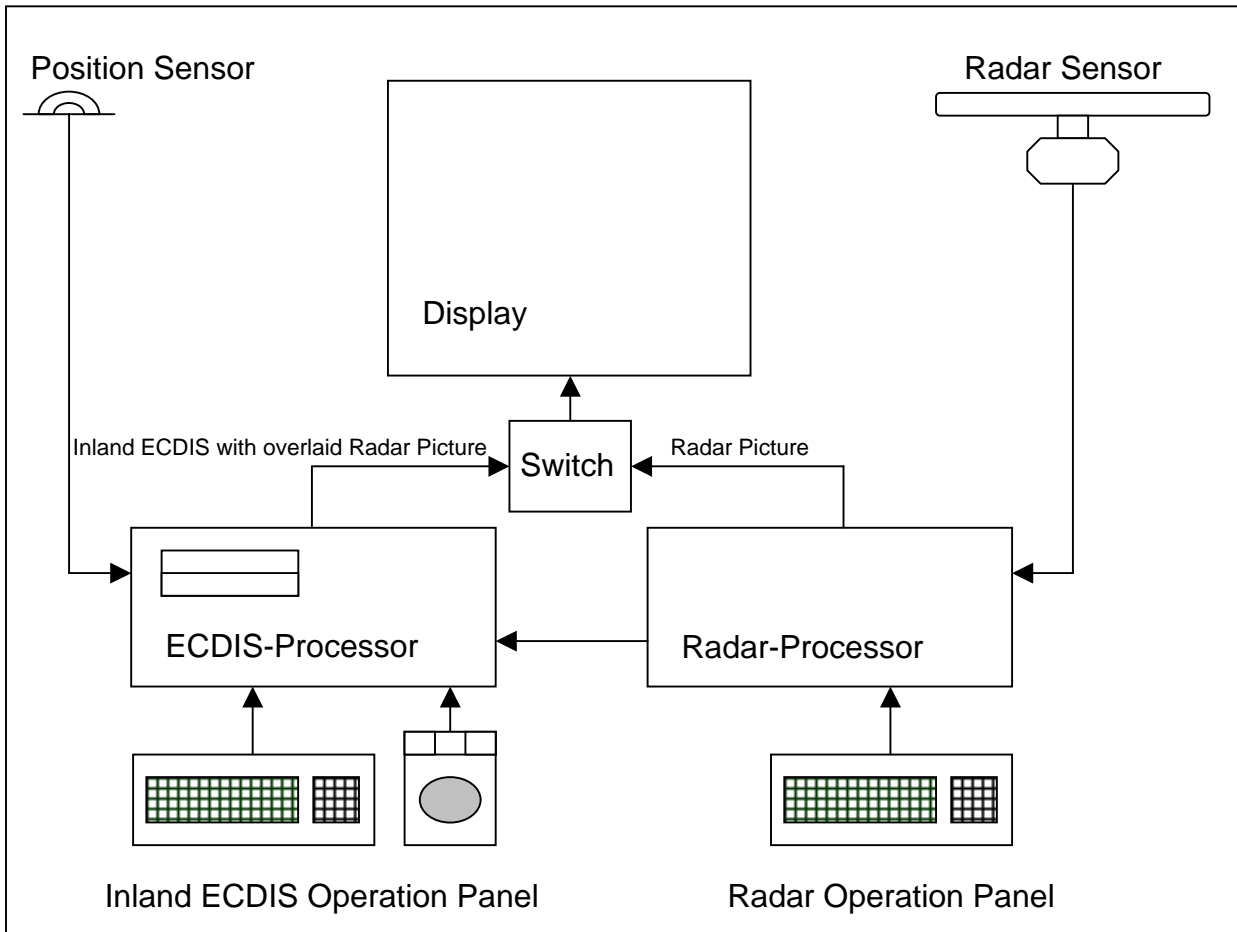


Fig. 3: Inland ECDIS equipment with connection to radar and shared monitor

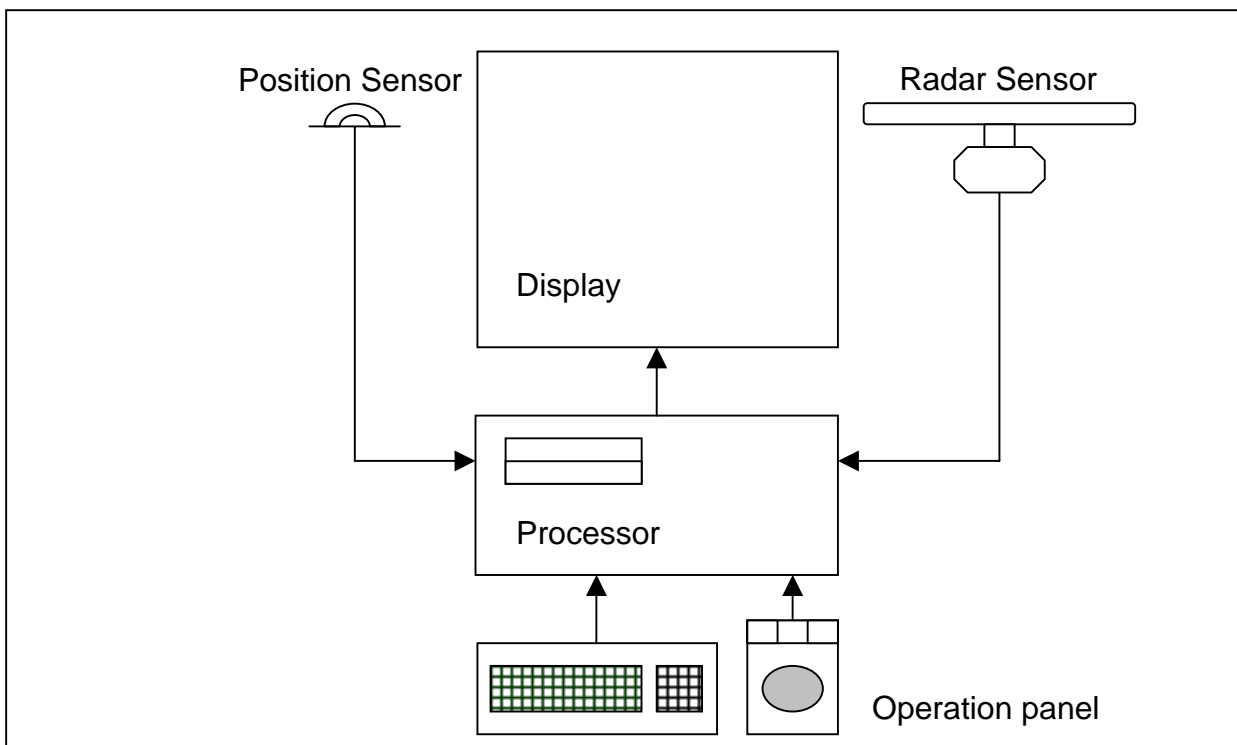


Fig. 4: Navigational radar equipment with integrated Inland ECDIS functionality

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Standard

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*Electronic Chart Display and Information System
for Inland ECDIS*

Inland ECDIS

SECTION 5

Glossary of Terms

Sources

- 1 IMO Resolution A.817(19)
- 2 IHO S-52 (especially Appendix 3 “Glossary of ECDIS-related Terms”)
- 3 IHO S-57 (especially Part 1 “General Introduction”, clause 5 “Definitions”)
- 4 Inland ECDIS Standard, Edition 2.0
 - 4.1 Section 1: Performance Standard for Inland ECDIS
 - 4.2 Section 2: Data Standard for Inland ENCs
 - 4.3 Section 2a: Codes for Producers and Waterways
 - 4.4 Section 3: Presentation Standard for Inland ECDIS
 - 4.5 Section 4: Operational and Performance Requirements, Methods of Testing and Required Tests Results including its appendices A and B
- 5 IENC Register
- 6 IEHG Product Specification for Inland ENCs
- 7 IEHG Inland ENC Feature Catalogue
- 8 IEC Guideline 1174
- 9 CCNR / ZKR Radar Regulations
- 10 CCNR / ZKR RIS Guidelines 2004

Remark:

Definitions of the features and attributes can be derived from

- the tables of IHO S-57, Appendix A “Object Catalogue”, and
- the Feature Catalogue for Inland ENCs at <http://ienc.openecdis.org>

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
Acronym	6-character-code of the feature/of the attribute 6-Zeichen-Code des Features/des Attributs Acronyme ; code en 6 caractères de la classe de Feature/de l'attribut 6-karakter code van het kenmerk/van het attribuut	3
AIS	Automatic Identification System: An automatic communication and identification system intended to improve the safety of navigation by assisting in the efficient operation of vessel traffic services (VTS), ship reporting, ship-to-ship and ship-to-shore operations. Automatisches Identifizierungssystem: Ein automatisches Kommunikations- und Identifikationssystem zur Verbesserung der Sicherheit der Navigation durch Unterstützung des effizienten Betriebs von Schiffsverkehrsdiensten (Vessel Traffic Services – VTS), bei Schiffsmeldungen, bei Schiff-Schiff und Schiff-Land (Kommunikations-)Vorgängen. Système automatique d'identification; un système automatique de communication et d'identification destiné à améliorer la sécurité de navigation par l'assistance à l'opération efficace de Vessel Traffic Services (VTS), ship reporting, opérations bateau – bateau et bateau – terre. Automatisch identificatie systeem: Een automatisch communicatie en identificatie systeem bedoelt om de veiligheid van de navigatie te verbeteren met assistentie in de efficiënte operatie van Vessel Traffic Services (VTS), scheepsrapportage, schip-schip en schip-wal operaties.	2
All information density	All information density (all display) means the maximum amount of SENC information. Here, in addition to the standard display, also all other objects are displayed, individually on demand. Höchstinformationsdichte (alles) (<i>All information Display</i>) bedeutet den gesamten Informationsumfang der SENC. Hier wird zusätzlich zur Standardinformationsdichte auch der Rest der Objekte - bei Bedarf abgestuft - dargestellt. Densité maximale d'information (maximum) (<i>All information display</i>) ; la densité maximale des informations de la SENC. Outre la densité d'information standard, cette configuration permet d'afficher les autres objets, individuellement si nécessaire. Maximale informatie (alles) betekent de complete hoeveelheid aan SENC informatie. Hier wordt, aanvullend aan de standaardinformatie, ook de rest van de objecten getoond, naar keuze instelbaar.	4.1
Attribute	A defined characteristic of an entity (e.g. the category of a light, the sector limits, the light characteristics etc.). Attribut; definierte Charakteristik einer Einheit (z.B. Kategorie eines Lichtzeichens, Sektorgrenzen, Helligkeitsstufen usw.) Attribut ; la caractéristique définie d'une unité (par ex. la catégorie d'un feu de signalisation, les limites d'un secteur, les caractéristiques de luminosité etc.)" Een gedefiniëerde karakteristiek van een eenheid (bijv. categorie van een licht, de sector grenzen, de licht karakteristieken etc.).	3
Attribute copied	S-57/S-100 attributes (with their complete list of attribute values) which were extended according to the requirements of Inland ECDIS. All new attributes have the same name like their source, but written in small case letters. Kopiertes Attribut; S-57/S100-Attribut (mit der kompletten Liste ihrer Attributwerte), das gemäß den Anforderungen von Inland ECDIS erweitert wurde. Alle neuen Attribute haben den gleichen Namen wie das ursprüngliche Attribut, allerdings in Kleinbuchstaben geschrieben. Attribut copié ; attributs S-57/S-100 (avec la liste complète des valeurs d'attributs) étendu conformément aux exigences du système ECDIS intérieur. Tous les nouveaux attributs portent le nom de l'attribut d'origine, mais écrit en minuscules. S-57/S-100 attributen (met de complete lijst van attribuut waarden) die zijn uitgebreid overeenkomstig de eisen van Inland ECDIS. Alle nieuwe attributen hebben dezelfde naam als het oorspronkelijke attribuut, maar worden in kleine letters geschreven.	7

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
CCNR / ZKR	<p>Central Commission for Navigation on the Rhine; international commission based on the "Convention of Mannheim". Current Member States are Belgium, France, Germany, The Netherlands and Switzerland. The most important and permanent objectives of CCNR are:</p> <ul style="list-style-type: none"> • Prosperity of inland navigation on the Rhine and in Europe • Maintenance of the high level of safety in inland navigation and the integrity of the environment. <p>Zentralkommission für die Rheinschifffahrt; internationale Kommission auf Basis der "Mannheimer Akte". Derzeitige Mitgliedsstaaten sind Belgien, Frankreich, Deutschland, die Niederlande und die Schweiz. Die wichtigsten dauerhaften Ziele der ZKR sind:</p> <ul style="list-style-type: none"> • Prosperität der Rhein- und der europäischen Binnenschifffahrt • Erhaltung des hohen Sicherheitsstandards der Binnenschifffahrt und der Integrität der Umwelt. <p>Commission Centrale pour la Navigation du Rhin ; Comission internationale bsée sur l'"Acte de Mannheim". Etats membres actuels : Allemagne, Belgique, France, Pays-Bas, Suisse. Les principaux objectifs permanents de la CCNR sont :</p> <ul style="list-style-type: none"> • assurer la prospérité de la navigation intérieure sur le Rhin et en Europe • maintenir le niveau élevé de sécurité de la navigation intérieure et de son environnement <p>Centrale Commissie voor de Rijnvaart; internationale commissie gebaseerd op de "Mannheimer Akte". Huidige lidstaten zijn België, Frankrijk, Duitsland, Nederland en Zwitserland. De belangrijkste en permanente doelen van de CCR zijn:</p> <ul style="list-style-type: none"> • Welslagen van binnenvaart op de Rijn en in Europa • Handhaving van hoog niveau van veiligheid van de binnenvaart en haar omgeving. 	
Cell (chart cell)	<p>A cell is a geographical area containing Inland ENC data.</p> <p>Eine Zelle ist ein geografisches Gebiet, das Inland ENC Daten enthält.</p> <p>Cellule (partie de la carte) ; aire géographique contenant des données de CEN Intérieure.</p> <p>Een cel is een geografisch gebied die Inland ENC data bevat.</p>	3
CIE colour calibration	<p>Procedure to confirm that the colour specified in IHO S-52 is correctly reproduced on the ECDIS display.</p> <p>CIE-Farbenkalibrierung; Verfahren zur Gewährleistung, dass die in IHO S-52 Anhang 2 festgeschriebenen Farben korrekt auf dem ECDIS-Bildschirm wiedergegeben werden.</p> <p>Calibrage des couleurs CEI ; Procédure destinée à confirmer que les couleurs spécifiées dans le document OHI-S-52, appendice 2, sont correctement reproduites à l'écran ECDIS.</p> <p>Procedure om vastteleggen dat de in IHO S-52 vastgelegde kleuren correct op het ECDIS-beeldscherm worden weergegeven.</p>	2
Collection feature	<p>Type of feature containing information about the relationships between other features.</p> <p>Feature-Typ, der Informationen über Beziehungen von Features untereinander enthält.</p> <p>Collection Feature ; type de Feature contenant des informations relatives aux liens entre d'autres Features.</p> <p>Type van een kenmerk dat informatie bevat over de relatie tussen de andere kenmerken.</p>	3

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
Compilation scale	<p>The scale with which the chart information meets the IHO requirements for chart accuracy. It is established by the producing Hydrographic office and encoded in the ENC.</p> <p>Kompilations (zusammengetragener, zusammengestellter -) maßstab; der Maßstab, bei dem die Karteninformation exakt die IHO-Anforderungen hinsichtlich der Kartengenauigkeit erfüllt; wird vom Hersteller (hydrografische Behörde) festgelegt und in ENC's verschlüsselt.</p> <p>Echelle de compilation ; l'échelle à laquelle l'information cartographique est parfaitement conforme aux exigences de l'OHI relatives à la précision de la carte. Elle est établie par le fabricant (administration hydrographique) et incorporée sous forme de code dans les CEN.</p> <p>De schaal waarmee de kaart informatie overeenkomt met de IHO eisen voor kaart nauwkeurigheid. Het wordt vastgesteld door de producerende hydrografische autoriteit en in de ENC geïncorporeerd.</p>	6
Datum	<p>A set of parameters specifying the reference surface or the reference coordinate system used for geodetic control in the calculation of coordinates of points on the earth. Commonly datums are defined as horizontal and vertical datums separately. For the practical use of the datum it is necessary to have one or more well distinctive points with coordinates given in that datum.</p> <p>Datensatz, der die Bezugsebene oder das Bezugskordinatensystem festlegt, die/das für die geodätische Überprüfung bei der Berechnung der Koordinaten von Punkten auf der Erde verwendet wird. Gewöhnlich sind Datensätze jeweils als horizontale und vertikale Datensätze definiert. Für die praktische Anwendung der Datensätze ist/sind ein oder mehrere markante (Referenz-) Punkt(e) mit Koordinaten in diesem Datensatz erforderlich.</p> <p>Données ; série de paramètres spécifiant l'aire de référence ou le système des coordonnées de référence utilisés pour le contrôle géodésique lors du calcul des coordonnées de points sur la terre. Les séries de paramètres sont généralement définies en tant que séries horizontales et verticales de paramètres. L'application pratique des séries de paramètres nécessite un ou plusieurs points de référence caractéristiques assortis des coordonnées de cette série de paramètres.</p> <p>Data; een set van parameters die het referentie vlak of het referentie coördinatie systeem gebruikt voor de geodetische controle bij de berekening van coördinaten van punten op de aarde specificeren. Gewoonlijk zijn gegevens gescheiden gedefiniëerd als horizontale en verticale gegevens. Voor het praktische gebruik van de gegevens is het noodzakelijk dat er één of meer onderscheidende punten met coördinaten worden gegeven in die gegevens.</p>	2
Datum, horizontal	<p>A set of parameters specifying the reference for horizontal geodetic control, commonly the dimensions and the location of a reference ellipsoid. (The horizontal datum must be WGS 84.)</p> <p>Datensatz, der den Bezug für die geodätische Überprüfung der horizontalen Koordinaten festlegt, gewöhnlich die Abmessungen und die Lage eines Referenzellipsoids. (Das horizontale Kartendatum muss WGS 84 sein.)</p> <p>Données, horizontal ; une série de paramètres spécifiant la référence pour le contrôle géodésique horizontal, généralement les dimensions et la position d'un ellipsoïde de référence. (Le paramètre horizontal doit être WGS 84).</p> <p>Data, horizontaal; een set van parameters die de referentie voor de horizontale geodetie specificeren, gewoonlijk de dimensies en de plaats van een referentie ellipsoïde (De horizontale gegevens zijn volgens WGS 84)</p>	6

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
Datum, vertical	<p>A surface to which elevations and/or depths (soundings and tide heights) are referred. For elevations commonly a level (equipotential) surface, approximately the mean sea level is used, for depths in many cases low water.</p> <p>Eine Ebene auf die sich Höhen bzw. Tiefen (Peilungen und Tidehöhen) beziehen; für Erhebungen (im Sinne von Höhen) gewöhnlich eine (einheitliche) Oberfläche, meist die Meeresebene (m über Normal Null), für Tiefen meist Niedrigwasser.</p> <p>Données, vertical ; une série de paramètres spécifiant la référence pour le contrôle géodésique horizontal, généralement les dimensions et la position d'un ellipsoïde de référence. (Le paramètre horizontal doit être WGS 84).</p> <p>Data, verticaal; Een vlak waarop zich de hoogte en de diepte (peilingen en getijde hoogte) zich betrekken. Voor verhogingen (in de zin van hoogtes) gewoonlijk een oppervlak, meestal de zeespiegel (m boven NAP), voor diepte meestal laag water.</p>	6
Differential GPS (DGPS)	<p>A form of GPS in which the reliability and accuracy are enhanced by broadcasting a time-varying correction message from a GPS monitoring receiver (differential mode) at a known position on shore. The corrections are fed automatically into the GPS receiver onboard and used to compute an improved position.</p> <p>Eine Form von GPS, bei dem die Zuverlässigkeit und Genauigkeit verbessert werden von der Funkübertragung eines zeitverschobenen Korrektursignals von einem GPS-Empfänger (Differenzanteil, Unterschiedlichkeitsprinzip) mit bekannter Position an Land. Die Korrekturen werden automatisch in den GPS-Empfänger an Bord eingespeist und zur Berechnung einer verbesserten Position verwendet.</p> <p>GPS différentiel (DGPS) ; une forme de GPS avec laquelle la fiabilité et la précision peuvent être améliorés par la transmission radioélectrique d'un signal temporisé de correction d'un récepteur GPS (mode différentiel) pour une position connue par rapport à la surface. Les corrections sont intégrées automatiquement par le récepteur GPS à bord et sont utilisées pour le calcul de la correction de la position.</p> <p>Een vorm van GPS, waarbij de betrouwbaarheid en de nauwkeurigheid beïnvloed wordt door de uitzending van een in tijd variërend correctiesignaal van een GPS ontvanger (differentieel modus) op een bekende positie aan land. De correcties worden automatisch in de GPS ontvanger aan boord geïntegreerd en voor de berekening van een verbeterde positie gebruikt.</p>	4
Display base	<p>Minimum information density; means the minimum amount of SENC information that is presented and which cannot be reduced by the operator, consisting of information that is required at all times in all geographic areas and under all circumstances.</p> <p>Basisanzeige, Mindestinformationsdichte; Mindestumfang an SENC-Information, der dargestellt wird und der durch den Betreiber nicht reduziert werden kann; enthält die Informationen, die jederzeit in sämtlichen geografischen Bereichen und unter allen Umständen erforderlich sind.</p> <p>Base de visualisation, densité minimale d'information ; désigne la quantité minimale d'information SCEN visualisable qui ne peut être réduite par l'utilisateur et contient les informations requises en permanence dans tous les secteurs géographiques et en toutes circonstances.</p> <p>Minimum informatie dichtheid, betekent de minimum hoeveelheid van SENC informatie dat wordt gepresenteerd en dat niet kan worden gereduceerd door de gebruiker; bevat de informatie dat onder alle omstandigheden wordt vereist in alle geografische gebieden.</p>	1
Display scale	<p>The ratio between a distance on the display and a distance on the ground, normalised and expressed as a ratio, e.g. 1:10 000.</p> <p>Anzeigemaßstab; das Verhältnis zwischen der Entfernung auf der Anzeige und der Entfernung auf der Erde, genormt und ausgedrückt als Maßstab, z.B. 1:10 000.</p> <p>Echelle d'affichage ; le rapport entre la distance affichée et la distance réelle, normalisé et exprimé par une échelle, par exemple : 1:10 000.</p> <p>De verhouding tussen een afstand op de weergave en een afstand op de grond, genormaliseerd en uitgedrukt als verhouding, bijv. 1 : 10.000.</p>	2

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
EBL	Electronic Bearing Line Elektronische Peillinie Relèvement électronique Elektrische peilingslijn	4.5
ECDIS	<p>Electronic Chart Display and Information System; A navigation information system which 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. The performance requirements for ECDIS are defined in the Performance Standard for ECDIS developed by IMO/IHO HGE (Harmonized Group on ECDIS).</p> <p>Elektronisches Kartenanzeige- und Informationssystem; Navigations-Informationssystem, das mit den aktuellen Karten gemäß der Anforderung V/20 des SOLAS-Vertrages von 1974 übereinstimmt; Anzeige einer herstellereigenen (systemeigenen) elektronischen Navigationskarte (SENC) mit Positions-Informationen von Navigationssensoren zur Unterstützung des Schiffsführers bei der Reiseplanung und Reiseüberwachung und auf Wunsch Anzeige von navigationsbezogenen Informationen. Die Leistungsanforderungen für ECDIS sind im Leistungsstandard für ECDIS definiert, der von der IMO/IHO HGE (Harmonisierte Gruppe für ECDIS) erarbeitet wurde.</p> <p>Système électronique d'affichage de cartes et d'informations; Système d'information pour la navigation correspondant aux cartes actualisées conformément aux exigences de la réglementation V/20 de la Convention SOLAS de 1974; affichage d'une carte électronique de navigation (SENC) propre au fabricant (et au système) comportant des indications relatives à la position fournies par des capteurs et destinée à assister le conducteur lors de la planification et la surveillance du voyage par la mise à disposition d'informations relatives à la navigation affichables sur demande. Les exigences relatives aux performances du système ECDIS sont définies dans le standard de performance pour le système ECDIS élaboré par OMI/OHI HGE (Groupe harmonisé pour ECDIS)</p> <p>Elektronische kaart weergave en informatie systeem; een navigatie informatie systeem dat met de actuele kaart overeenkomstige de eisen V/20 van het SOLAS verdrag van 1974 overeenkomt, door weergave van geselecteerde informatie van een systeem elektronische navigatie kaart (SENC) met positieinformatie van navigatiesensoren ter ondersteuning van de schipper bij de reisplanning en reis monitoring en op verzoek weergave van aanvullende navigatie gerelateerde informatie. De prestatie eisen voor ECDIS zijn in de prestatie standaard voor ECDIS gedefinieerd, die door de IMO/IHO ontwikkeld werd (Geharmoniseerde groep voor ECDIS).</p>	1
Edge	A one-dimensional spatial object, located by two or more coordinate pairs (or two connected nodes) and optional interpolation parameters. Schneide, scharfe Kante, Rand, Saum; Eindimensionales räumliches Objekt, festgelegt durch zwei oder mehr Koordinatenpaare (oder zwei verbundene Knoten) und wahlweise Interpolationsparametern. Limite, arête, bord, lisière; objet spatial unidimensionnel représenté sur la base de deux (ou plus) paires de coordonnées (ou par deux points nodaux) et des paramètres optionnels d'interpolation. Rand; een eendimensionaal ruimtelijk object, vastgelegd door twee of meer coördinaten paren (of twee verbonden knooppunten) en optioneel interpolatie parameters.	3

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
Electronic chart	<p>Very broad term to describe the data, the software, and the electronic system, capable of displaying chart information. An electronic chart may or may not be equivalent to the paper chart required by SOLAS.</p> <p>Elektronische Karte; breitgefächerter Begriff zur Beschreibung der Daten, der Software und des elektronischen Systems für die Fähigkeit, Karteninformationen anzuzeigen. Die elektronische Karte kann aber muss nicht gleich der Papierkarte sein, die SOLAS fordert.</p> <p>Carte électronique; désignation générique utilisé pour la description de données, de logiciels et du système électronique capable d'afficher des informations cartographiques. La carte électronique ne doit pas nécessairement être identique à la carte imprimée exigée par SOLAS.</p> <p>Erg ruime term voor beschrijving van de gegevens, de software en het elektronische systeem, in staat kaart informatie weer te geven. Een elektronische kaart kan of kan niet zijn conform de papieren kaart vereist door SOLAS.</p>	2
ENC	<p>Electronic Navigational Chart; The 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 (eg sailing directions) which may be considered necessary for safe navigation.</p> <p>Elektronische Navigationskarte; Datengrundlage standardisiert nach Inhalt, Aufbau und Form und durch staatliche hydrografische Behörden zur Verwendung von ECDIS herausgegeben; enthält alle für eine sichere Navigation notwendigen Karteninformationen und darf zusätzliche Informationen zu denen, die in der Papierkarte vorhanden sind (z.B. Fahrtrichtungen) enthalten, die als für die sichere Navigation wichtig angesehen werden.</p> <p>CEN ; Carte Electronique de Navigation; base de données standardisée suivant son contenu, sa structure et sa forme et publiée par les administrations hydrographiques nationales en vue de l'utilisation avec le système ECDIS; comporte toutes les informations cartographiques nationales nécessaires pour assurer la sécurité de la navigation et peut contenir des informations s'ajoutant à celles offertes par la carte imprimée (par ex. sens de navigation du bateau) et jugées importantes pour la sécurité de la navigation.</p> <p>Elektronische navigatie kaart; de database gestandaardiseerd naar inhoud, opbouw en vorm en door de bevoegde autoriteiten van het hydrografisch bureau uitgegeven voor gebruik met ECDIS. De ENC bevat alle kaart informatie noodzakelijk voor de veilige navigatie en kan aanvullende informatie bevatten ten opzichte van dat wat de papieren kaart bevat (bijv. vaarrichtingen) die mag worden meegewogen noodzakelijk voor de veilige navigatie.</p>	1
ENC cell	<p>The geographic division of ENC data for distributing purposes.</p> <p>ENC-Zelle (-Kartenabschnitt, d.A.); der geografische Kartenabschnitt der ENC für einen bestimmten Zweck, z.B. den Vertrieb.</p> <p>Cellule CEN; secteur géographique de la carte CEN réservé à un usage donné.</p> <p>ENC cel; het geografische gedeelte van de ENC voor een bepaald doel.</p>	8
Enumeration	<p>A specific quality or quantity assigned to an attribute (e.g. "leading light", the limiting angles, the code specifying the light's colour – see attribute).</p> <p>Aufzählung / Wert ; eine spezifische Quantität oder Qualität, die einem Attribut zugeordnet ist (z.B. Leitfeuer, die Grenzwinkel, der die Lichtfarbe spezifizierende Code – siehe Attribute).</p> <p>Énumération ; une qualité ou quantité spécifique affectée à un attribut (par ex. "feu de guidage", les angles de délimitation, le code spécifiant la couleur du feu – voir attributs).</p> <p>Opsomming; een specifieke kwaliteit of hoeveelheid toegewezen aan een attribuut (bijv. "bepalend licht", de beperkte hoeken, code die de lichtkleur specificieert – zie attribuut)</p>	7

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
Exchange format	<p>A specification for the structure and organization of data to facilitate exchange between computer systems.</p> <p>Austauschformat; eine Beschreibung für die Struktur und Organisation von Daten zur Erleichterung des Austausches zwischen Computersystemen.</p> <p>Format d'échange ; une spécification pour la structure et l'organisation de données visant à faciliter l'échange entre des systèmes informatiques.</p> <p>Wissel format; een beschrijving voor de structuur en organisatie van gegevens ter vereen vouding van een wisseling tussen computersystemen.</p>	2
Exchange set	<p>Set of files representing a complete, single purpose (i.e. product specific) data transfer. For example, the ENC product specification defines an exchange set which contains one catalogue file and at least one data set file.</p> <p>Austauschsatz; Satz von Dateien für einen kompletten zweckgebundenen (z.B. produktspezifischen) Datentransfer; z.B. definiert die ENC-Produktbeschreibung einen Austauschdatensatz, der eine Katalogdatei und eine Datensatzdatei enthält.</p> <p>Fichier d'échange; série de données pour un transfert de complet et déterminé de données (par ex. spécifique au produit), ainsi, la spécification de produit CEN définit un fichier d'échange comportant un fichier catalogue et un fichier de données.</p> <p>Wisselset; Serie van gegevens voor een complete doelgebonden datatransfer (bijv. product specifiek). Bijv definieert de ENC product specificaties een wisselset die een catalogus bestand en een gegevens bestand bevat.</p>	2
Feature	<p>An identifiable set of information. A feature may have attributes and may be related to other features.</p> <p>A digital representation of all or a part of an entity by its characteristics (attributes), its geometry, and (optionally) its relationships to other features (e.g., the digital description of a light sector specifying, amongst others, sector limits, the colour of the light, the visibility range, etc., and a link to a light tower, if any).</p> <p>Ein identifizierbarer Satz von Informationen. Ein Feature kann Attribute haben und auf andere Features bezogen sein.</p> <p>Digitale (Daten und Informationen in Zeichenform enthaltende) Darstellung von Gegenständen (zu Gänze oder Teile davon) mit ihren Charakteristiken (Attribute), ihrer Geometrie, und wahlweise in ihrer Beziehung zu anderen Merkmalen (z.B. verschlüsselte Beschreibung eines Leuchfeuersektors, mit unter anderem Sektorgrenzen, Farbe des Lichts, Reichweite der Sichtbarkeit, Verbindung mit einem Leuchtturm).</p> <p>Feature ; une série identifiable d'informations. Une Feature peut avoir des attributs ou se référer à d'autres Features.</p> <p>Une représentation digitale de l'intégralité ou d'une partie d'une entité par ses caractéristiques (attributs), sa géométrie et, en option, ses liens avec d'autres attributs (par exemple la description digitale d'un secteur présentant des feux, spécifiant notamment les limites du secteur, la couleur des feux, sa distance de visibilité etc. ainsi qu'un lien vers un phare s'il existe.</p> <p>Kenmerk; een identificeerbare set van informatie. Een kenmerk kan attributen hebben en kan in verband staan met andere kenmerken.</p> <p>Een digitale voorstelling van alle of een gedeelte van een entiteit door de karakteristieken (attributen), de geometrie en (optioneel) de verhouding tot andere kenmerken (bijv., de digitale beschrijving van een sectorlicht specificerend, onder andere, sector grenzen, de kleur van het licht, de zichtbaarheid, etc. en een schakel met de vuurtoren, als die er is).</p>	2
Feature catalogue	<p>The comprehensive list of currently identified features, attributes and enumerations which are allowed for the use in Inland ENCs.</p> <p>Feature Katalog, Zusammenfassung aller derzeit identifizierten Features, Attribute und deren Werte, die für die Verwendung in Inland ENC zugelassen sind.</p> <p>Feature Catalogue ; la liste complète des Features, attributs et énumérations actuellement identifiés et admis pour une utilisation dans les CEN Intérieure.</p> <p>Kenmerkcatalogus; de uitgebreide lijst van gangbaar geïdentificeerde kenmerken, attributen en opsomming die zijn toegestaan voor het gebruik van ENCs.</p>	7

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
Feature copied	<p>S-57 features (with their complete set of attributes) which were extended according to the requirements of Inland ECDIS. All new features have the same name like their source, but are written in small case letters.</p> <p>Kopiertes Feature; S-57 Feature (mit ihrem kompletten Satz von Attributen) erweitert gemäß den Anforderungen von Inland ECDIS. Alle neuen Feature haben den gleichen Namen wie ihr Ursprung, sind allerdings in Kleinbuchstaben geschrieben.</p> <p>Feature copiée ; features S-57 (avec leurs séries complètes d'attributs) qui ont été étendus conformément aux exigences du système ECDIS Intérieur. Toutes les nouvelles Features possèdent le même nom que leur source mais s'écrivent en lettres minuscules.</p> <p>Gekopiëerde kenmerk; S-57 kenmerken (met de complete set van attributen) die worden verspreid volgens de eisen van Inland ECDIS. Alle nieuwe kenmerken hebben dezelfde naam als hun bron, maar worden geschreven in kleine letters.</p>	7
Feature Data Dictionary	<p>A feature data dictionary specifies independent sets of features and attributes that may be used to describe geographic information in a particular context. A feature data dictionary may be used to develop a feature catalogue.</p> <p>Ein Featuredatenbeschreibungsverzeichnis spezifiziert unabhängige Sätze von Features und Attributen, die zur Beschreibung geografischer Informationen in einem bestimmten Zusammenhang benutzt werden können.</p> <p>Dictionnaire des données de Features ; définit des séries indépendantes de Features et attributs pouvant être utilisées pour décrire des informations géographiques dans un contexte particulier.</p> <p>Een kenmerk gegevens woordenboek specificiert onafhankelijke sets van kenmerken en attributen die kunnen worden gebruikt om geografische informatie in een afzonderlijke context te beschrijven. Een kenmerk gegevens woordenboek kan worden gebruikt om een kenmerk catalogus te ontwikkelen.</p>	
File	<p>An identified set of S-57 records collected together for a specific purpose. The file content and structure must be defined by a product specification.</p> <p>Datei; ein übereinstimmender Satz von S-57-Aufzeichnungen, zusammengestellt für einen bestimmten Zweck; Inhalt und Aufbau müssen durch eine Produktbeschreibung definiert sein.</p> <p>Fichier ; une série d'enregistrements S-57 compilée pour un usage donné; le contenu et la structure doivent être définis par une spécification de produit.</p> <p>File; een overeenstemmende set van S-57 gegevens, samengesteld voor een speciaal doel; Inhoud en opbouw moeten door een productbeschrijving gedefinieerd worden.</p>	2
Geo Feature	<p>Type of feature containing the descriptive characteristics of a real world entity.</p> <p>Eine Art des Features; enthält beschreibende Eigenschaften der realen Welt.</p> <p>Géo Feature ; un type de Feature caractéristique; contient les caractéristiques descriptives du monde réel.</p> <p>Type van kenmerk die de beschrijvende karakteristieken van de werkelijke wereld entiteit bevat</p>	2
Geometric Primitive	<p>One of three basic geometric units of representation: point, line and area.</p> <p>Geometrisches Grundelement; eines der drei geometrischen Darstellungselemente: Punkt, Linie und Fläche.</p> <p>Élément géométrique de base; l'une des trois unités géométriques de représentation : point, ligne et aire.</p> <p>Geometrisch basiselement; een van de drie weergave elementen: punt, lijn en vlak.</p>	2

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
Heading	<p>The direction in which the longitudinal axis of a craft is pointed, usually expressed as an angular distance from north clockwise through 360 degrees (true, magnetic or compass).</p> <p>Fahrtrichtung / Steuerkurs; Richtung in die die Längsachse eines Schiffes zeigt; üblicherweise ausgedrückt in Grad (°) abweichend von Nord im Uhrzeigersinn durch 360 Grad (tatsächlich, magnetisch oder Kompass).</p> <p>Sens de navigation ; sens dans lequel pointe l'axe longitudinal d'un bateau, généralement exprimé e,n distance angulaire à 360 ° en sens horaire par rapport au nord (effectif, magnétique ou du compas).</p> <p>Vaarrichting; De richting waarin de lengte as van een schip wijst; gewoonlijk uitgedrukt in een hoekafstand van het noorden middels 360 ° Daadwerkelijk, magnetische of Kompas) aanpassen.</p>	2
Head-up display	<p>The information shown on the display (radar or ECDIS) is directed so that the vessel's heading is always pointing upward. This orientation corresponds to the visual view from the bridge in direction of the ship's heading. This orientation may require frequent rotations of the display contents. Changing the ship's course, or yawing of the vessel may render this unstabilized orientation mode unreadable.</p> <p>Kurs-Voraus-Anzeige; die Bildschirmanzeige (Radar oder ECDIS) ist so ausgerichtet, dass der (Steuer-)Kurs des Schiffes immer nach oben zeigt. Diese Ausrichtung stimmt mit dem Ausblick von der (Schiffs-)Brücke in Kursrichtung des Schiffes überein. Diese Ausrichtung kann häufige Drehungen des Anzeigeninhaltes erfordern. Änderungen des Schiffskurses oder plötzliches Gieren können dazu führen, dass diese instabile Ausrichtungsart unlesbar wird.</p> <p>Affichage cap à l'avant ; affichage à l'écran (radar ou ECDIS) orienté de façon à ce que le cap du bateau pointe toujours vers le haut de l'écran. L'orientation correspond à la vue depuis le pont (du bateau) dans le sens de navigation. Cette orientation peut nécessiter de fréquentes rotations du contenu affiché. La modification du cap ou un virage soudain peuvent rendre illisible ce mode d'orientation instable.</p> <p>Koersvoor weergave; Een beeldschermweergave (radar of ECDIS) is zo ingricht dat de koers van het schip altijd naar boven wijst. Deze oriëntatie stemt overeen met het uitzicht vanuit de stuurhut in de koersrichting van het schip. Deze oriëntatie kan frequente draaiing van het beeld vereisen. Veranderingen van de scheepskoers, of plotseling gieren kan deze instabiele oriëntatie onleesbaar weergeven.</p>	2
IEC	<p>International Electrotechnical Commission: An international (non-governmental) organization which produces world standards for electrical and electronic engineering with the objective of facilitating international trade.</p> <p>Internationale Elektrotechnische Kommission; internationale (regierungsunabhängige) Organisation, die weltweite Standards für Elektrik und Elektrotechnik zur Erleichterung des internationalen Handels herausgibt.</p> <p>Commission Electrotechnique Internationale ; une organisation internationale (non gouvernementale) de normalisation sur le plan mondial dans le domaine de l'électricité et de l'électrotechnique visant à faciliter le commerce international.</p> <p>Internationale elektronische commissie; Een internationale organisatie (niet regeringsgebonden) die wereldwijd standaarden voor electriciteit en elektrotechniek voor vereenvoudiging van de internationale handel uitgeeft.</p>	2

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
IHO	<p>International Hydrographic Organization: Coordinates the activities of national hydrographic offices; promotes standards and provides advice to developing countries in the fields of hydrographic surveying and production of nautical charts and publications.</p> <p>Internationale Hydrografische Organisation; koordiniert die Aktivitäten der nationalen hydrografischen Institutionen, verbreitet Standards und berät Entwicklungsländer auf dem Gebiet der hydrografischen Vermessung und Produktion von nautischen Karten und Veröffentlichungen.</p> <p>Organisation hydrographique internationale; coordonne les activités des institutions hydrographiques nationales, publie des standards et conseille des pays en voie de développement dans le domaine de l'étude hydrographique ainsi que de la production de cartes nautiques et de publications.</p> <p>Internationale hydrografische organisatie; coordineert de activiteiten van de nationale instituten, bevordert standaarden en geeft advies aan ontwikkelingslanden op het gebied van hydrografische metingen en productie van nautische kaarten en publicaties.</p>	2
IHO registry	<p>A "registry" is the entire information system (or location) in which a collection of registers is located. In the case of the future S-57 (the so-called S-100) IHO will host a registry that will provide a facility to store various registers of hydrographic -related information. This will include feature data dictionaries, metadata and code lists (e.g. sounding datums). There will be registers for Hydrographic Information, Dynamic Ice Coverage, Additional Military Layers (AMLs), and Inland ENCs. Other types of information that do not fit into these categories can be included in the Open ECDIS Forum (OEF) register. For each register there is an organization that will be responsible for its content and management.</p> <p>IHO Registratur; eine „Registratur“ ist das vollständige Informationssystem (oder der Ort), in dem eine Sammlung von Registern lokalisiert ist. Im Fall des künftigen S-57 (der so genannte S-100) wird die IHO eine Registratur zur Verfügung stellen, die eine Einrichtung zur Aufbewahrung von verschiedenen Registern für Hydrografiebezogene Daten beinhaltet. Dies wird Featuredatenwörterbücher, Metadaten und Codelisten (z.B. Peildaten) einschließen. Es wird Register für Hydrografische Informationen, für dynamische Eisbedeckung, Zusätzliche Militärische Schichten (AMLs) und Inland ENC geben. Andere Arten von Informationen, die nicht in diese Kategorien passen, können in das Open ECDIS Forum (OEF) Register eingefügt werden. Für jedes Register gibt es eine Organisation, die für sein Inhalt und seine Verwaltung zuständig ist.</p> <p>Enregistrement OHI ; désigne l'intégralité d'un système d'information (ou un emplacement) contenant une collection de registres. Dans le cas du futur S-57 (dit S-100), l'OHI va héberger un registre permettant de stocker différentes séries de données hydrographiques et connexes. Il comprendra des dictionnaires de données des Features, des métadonnées et des listes de codes (par exemple des relevés de hauteurs d'eau). Il existera des fichiers de données pour l'information hydrographique, les informations dynamiques relatives à la glace, des couches militaires supplémentaires (AMLs) et des CEN Intérieure. D'autres types d'informations qui n'entrent pas dans ces catégories peuvent être inclus dans le fichier de données du Open ECDIS Forum (OEF). Pour chaque fichier de données, une organisation sera responsable du contenu et de la gestion.</p> <p>IHO registratie; een registratie is het totale informatie systeem (of locatie) waar een verzameling van registreerd is samengebracht. In het geval van de toekomstige S-57 (de zogenaamde S-100) zal de IHO een registratie verzorgen dat een faciliteit zal voorzien om de verschillende registers van hydrografisch gerelateerde informatie op te slaan. Dis is inclusief kenmerk gegevens wordenboeken, meta gegevens en code lijsten (bijv. peiling gegevens). Er zullen registers zijn voor hydrografische informatie, dynamische ijs gegevens, toegevoegde militaire lagen (AML's), en Inland ENC's. Ondere vormen van informaties die niet vallen binnen deze categorien kunnen worden toegevoegd aan het open ECDIS forum (OEF) register. Voor elk register is er een organisatie die verantwoordelijk is voor de inhoud en het beheer.</p>	

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
(IHO-) S-52	Specifications for chart content and display aspects of ECDIS. Beschreibung für Karteninhalt und Gesichtspunkte der Darstellung von ECDIS. Spécification du contenu des cartes et des aspects de visualisation ECDIS. Specificaties voor de kaartinhoud en de aspecten van de weergave van kaarten.	2
(IHO-) S-52 App. 1	Guidance on updating the Electronic Navigational Chart Leitlinie für das Aktualisieren der ENC der IHO. Lignes directrices pour l'actualisation des CEN de l'OHI. Richtlijnen voor actualisering van de ENC	2
(IHO-) S-52 App. 2	Colour and symbols specifications for ECDIS. Farb- und Symbolbeschreibungen für ECDIS. Description des couleurs et symboles pour ECDIS. Kleur- en symboolbeschrijving voor ECDIS	2
(IHO-) S-57	IHO Transfer standard for digital hydrographic data. IHO-Übertragungsstandard für digitale hydrografische Daten. Norme de l'OHI pour la transmission digitale de données hydrographiques. IHO overdrachtsstandaard voor de digitaler hydrografische kaarten.	3
(IHO-) S-57 App. A	IHO Object Catalogue. IHO-Objektkatalog für ECDIS. Catalogue d'objets de l'OHI pour le système ECDIS. IHO objecten catalogus	3
(IHO-) S-57 App. B	ENC Product Specifications. Produktbeschreibung für ENC. Spécification de produit pour les CEN. Product beschrijvingen voor ENC gegevens.	3
(IHO-) S-62	ENC Producer Codes Codes für Hersteller von ENC. Codes de fabricants de CEN ENC producenten codes	

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
IMO	<p>International Maritime Organization: Formerly called IMCO, the IMO is the specialized agency of the United Nations responsible for maritime safety, efficiency of navigation and prevention of marine pollution from ships.</p> <p>Internationale Seefahrtskommission; früher IMCO, die IMO ist die Behörde der Vereinten Nationen, die sich mit der Sicherheit und Wirtschaftlichkeit der Navigation auf See und der Verhütung von Meeresverschmutzung durch Schiffe befasst.</p> <p>Organisation Maritime Internationale ; anciennement IMCO, l'OMI est l'autorité des Nations-Unies chargée de la sécurité et de la rentabilité de la navigation maritime et de la prévention de la pollution marine.</p> <p>Internationale Maritime Organisatie; vroeger IMCO; de IMO is de autoriteit van de Verenigde naties, verantwoordelijk voor de veiligheid en de efficiëntie van de navigatie ter zee en voorkoming van de mariene vervuiling vanaf schepen.</p>	2
Information Mode	<p>means the use of the Inland ECDIS for information purposes only without overlaid radar image.</p> <p>Informationsmodus; Verwendung des Inland ECDIS nur für Informationszwecke ohne überlagertes Radarbild.</p> <p>Mode information; utilisation du système ECDIS intérieur limitée à l'information sans superposition de l'image radar.</p> <p>Informatiemodus; Gebruik van de Inland ECDIS alleen voor informatie doeleinden zonder overlapt radarbeeld.</p>	4.1
Inland AIS	<p>AIS for the use in inland navigation and interoperable with (maritime) AIS – technically enabled by amendments and extensions to the (maritime) AIS</p> <p>AIS für die Nutzung in der Binnenschifffahrt und interoperabel mit dem (maritimen) AIS – technisch ermöglicht durch Ergänzungen und (technischen) Erweiterungen des (maritimen) AIS.</p> <p>AIS Intérieur ; AIS utilisé en navigation intérieure, interoperable avec l'AIS maritime – adapté sur le plan technique par des modifications et extensions de l'AIS maritime</p> <p>AIS voor het gebruik in de binnenvaart en interoperabel met (maritieme) AIS – technisch in staat gesteld door aanvullingen en uitbreidingen van de (maritieme) AIS.</p>	
Inland ECDIS	<p>An Electronic Chart Display and Information System for inland navigation, displaying selected information from a Inland System Electronic Navigational Chart (Inland SENC) and optionally, information from other navigation sensors.</p> <p>Binnen-ECDIS; System zur elektronischen Darstellung von Karten der Binnenwasserstraßen und damit verbundenen Informationen, das ausgewählte Informationen aus einer herstellereigenen elektronischen Binnenschifffahrtskarte (Inland SENC) und wahlweise Informationen anderer Messwertgeber des Schiffes darstellt.</p> <p>ECDIS intérieur ; système électronique d'affichage de cartes des voies de navigation intérieure et des informations connexes présentant des informations sélectionnées à partir d'une carte électronique de navigation intérieure configurée par le fabricant (SCEN Intérieure) ainsi que des informations fournies par d'autres appareils de mesure du bateau.</p> <p>Binnen ECDIS; Systeem voor de elektronische weergave van binnenvaartkaarten en de daaraan verbonden informatie, die geselecteerde informatie uit een specifiek geproduceerde elektronische binnenvaartkaart (Inland SENC) en ter keuze informatie van andere navigatie sensoren weergeeft.</p>	4.1

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
Inland ENC (IENC)	<p>Inland Electronic Navigational Chart: The database, standardised as to content, structure and format, issued for use with Inland ECDIS. The Inland ENC complies to the IHO standards S-57, S-62 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.</p> <p>Elektronische Binnennavigationskarte; Datenbank, standardisiert bezüglich Inhalt, Struktur und Format, die zum Gebrauch mit Inland ECDIS herausgegeben wird; entspricht den IHO-Standards S-57, S-62 und S-52 mit den Ergänzungen und Klarstellungen dieses Standards für Inland ECDIS; enthält alle wesentlichen Karteninformationen und kann auch zusätzliche Informationen, die als hilfreich für die Schifffahrt angesehen werden können, enthalten.</p> <p>Carte Electronique de Navigation intérieure (CEN) ; base de donnée standardisée du point de vue de son contenu, de sa structure et de son format, publiée pour une utilisation avec le système ECDIS intérieur et conforme aux standards de l'OHI S-57, S-62 et S-52 complétés par des précisions relatives au système ECDIS intérieur; comporte toutes les informations cartographiques importantes et peut contenir d'autres informations susceptibles d'être utiles à la navigation.</p> <p>Inland ENC: de database, gestandaardiseerd zoals de inhoud, structuur en format, uitgegeven voor het gebruik met Inland ECDIS. De Inland ENC voldoet aan de IHO standaarden S-57, S-62 en S-52, vermeerderd met de toevoegingen en uitleg van de standaard voor Inland ECDIS. De Inland ENC bevat alle essentiële kaart informatie kan ook aanvullende informatie bevatten, dat als hulp voor de navigatie kan worden geacht.</p>	4.1
Inland ENC register	<p>Register within the registry of IHO dedicated for Inland ENC – related entries.</p> <p>Register in der Registratur der IHO vorbehalten für Eintragungen, die sich auf Inland ENC beziehen.</p> <p>Registe de CEN Intérieure ; enregistrement de données contenu dans le registre de l'OHI dédié entrées relatives aux CEN Intérieure.</p> <p>Register binnen de registratie van IHO bedoeld voor Inland ENC – gerelateerde ingangen.</p>	
Inland SENC	<p>Inland System Electronic Navigational Chart: A database resulting from the transformation of the Inland ENC by Inland ECDIS for appropriate use, updates to the Inland ENC by appropriate means and other data added by the mariner. It is this database that is actually accessed by the Inland ECDIS for the display generation and other navigational functions. The Inland SENC may also contain information from other sources.</p> <p>Herstellerspecifische Elektronische Binnenschiffahrtskarte; Datenbank, die sich aus der Transformation von Inland ENC durch Inland ECDIS für eine geeignete Anwendung ergibt und die durch Aktualisierungen der Inland ENCs mit geeigneten Mitteln und außerdem durch Daten des Schiffsführers ergänzt ist; Datenbank, auf die tatsächlich durch Inland ECDIS für die Erzeugung der Darstellung und anderer nautischer Funktionen zugegriffen wird. Inland-SENC kann auch Informationen aus anderen Quellen enthalten.</p> <p>Carte électronique pour la navigation intérieure configurée par le fabricant (SCEN) ; une base de données résultant de la transformation de la CEN intérieure par le système ECDIS intérieur en vue d'une utilisation appropriée et complétée par l'actualisation des CEN intérieure par des moyens appropriés et par des données ajoutées par le batelier; base de données effectivement consultée par le système ECDIS intérieur pour l'élaboration des données affichées et pour d'autres fonctions nautiques. La SCEN intérieure peut aussi contenir des informations provenant d'autres sources.</p> <p>Specifiek elektronische binnenvaartkaarten voor de navigatie; een databank, die het resultaat is van de transformatie van Inland ENC door Inland ECDIS voor een beplaat gebruik en die door actualisering van de Inland ENC met geëigende middelen en bovendien met data van de schipper aangevuld. Deze databank wordt feitelijk gebruikt door Inland ECDIS voor de ontwikkeling van de weergave en de andere nautische functies. De SENC kan ook informatie uit andere bronnen bevatten.</p>	4.1

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
INT 1	<p>International chart 1: Specification of symbols, abbreviations and terms to be used in the International Chart Series of IHO. (Provides the chart user with a key to symbols, abbreviations and terms used on charts compiled in accordance with the "Chart Specifications of the IHO").</p> <p>Contains description entries for features and attributes. Can be seen as the reference to the legend of paper charts.</p> <p>Internationale Karte 1: Spezifizierung von Symbolen, Abkürzungen und Begriffen zur Verwendung in der Internationalen Kartenreihe der IHO. (Versieht die Kartennutzer mit einem Schlüssel zu den Symbolen, Abkürzungen und Begriffen, der in im Einklang steht mit den gemäß „Kartenspezifizierung der IHO“ zusammengestellten Karten.</p> <p>Enthält Beschreibungen des Eintrages für Feature und Attribute. Kann als Referenz zu der Legende für Papierkarten angesehen werden.</p> <p>Carte internationale 1 : spécification de symboles, abréviations et termes à utiliser dans les séries de cartes internationales de l'OHI (fournit à l'usager de la carte une description des symboles, abréviation et termes utilisés dans les cartes réalisées suivant les "Spécifications relatives aux cartes de l'OHI").</p> <p>Contient des descriptions de Features et d'attributs. Peut être considéré comme équivalent aux légendes des cartes imprimées.</p> <p>Internationale kaart 1: Specificatie van symbolen, afkortingen en termen voor het gebruik in de internationale serie kaart en van de IHO. (Voorziet de kaart gebruiker van een sleutel tot de symbolen, afkortingen en termen gebruikt op kaarten samengesteld in overeenstemming met de "Kaart specificaties van de IHO")</p> <p>Bevat beschrijvende toegangen voor kenmerken en attributen. Kan worden gezien als een referentie voor de legenda van de papieren kaarten.</p>	2
Integrated display	<p>means a head-up, relative-motion picture consisting of the Inland SENC overlaid with the radar-image with matching scale, offset and orientation.</p> <p>Integrierte Darstellung; vorausorientiertes, relativ zum Schiff bewegtes Bild, bestehend aus der Inland-SENC und überlagert mit dem Radarbild mit angepasstem Maßstab, Exzentrizität und Ausrichtung.</p> <p>Visualisation intégrée; une image verticale de mobilité relative par rapport à la terre fournie par la SCEN intérieure, à laquelle est superposée une image radar aux paramètres d'échelle, de distance et d'orientation adaptées.</p> <p>Geïntegreerde weergave; vooruitgeoriënteerd, relatief t.o.v. het schip bewegend beeld, bestaande uit de Inland SENC bedekt met het radarbeeld met aangepaste schaal, excentriciteit en orientatie.</p>	4.1
Look-up table	<p>A table giving symbology instructions to link SENC objects to point, line or area symbolisation and providing display priority, radar priority, IMO category and optional viewing group.</p> <p>Look-up-Tafel (Übersichtstafel, Nachschlagetafel); eine Tabelle, die Symbolisierungsanweisungen zur Verbindung von SENC Einträgen mit Punkten, Linien oder Flächensymbolisierungen gibt und Anzeigeprioritäten, Radarpriorität, IMO Kategorie und optionale Abbildungsgruppe enthält.</p> <p>Table de recherche ; table fournissant des instructions de symbolisation pour l'association d'objets SCEN à des points, lignes ou symbolisations d'aires et spécifiant les priorités d'affichage, la priorité radar, la catégorie OMI et le groupe optionnel de visualisation.</p> <p>Weergavetabellen; een tabel weergave van symbolische instructie om SENC objecten te verbinden aan punten, lijnen en gebieds symbolen en stelt de weergave prioriteit, radar prioriteit, IMO categorie en optioneel afbeeldingsgroep vast</p>	2

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
M-4	<p>Gives chart specifications of the IHO for compiling nautical charts, together with agreed symbols and abbreviations adopted for general use by Member States. Provides also regulations for INT Charts.</p> <p>Contains description entries for features and attributes.</p> <p>Gibt Kartenspezifikationen der IHO für die Erstellung von Seekarten, zusammen mit abgestimmten Symbolen und Abkürzungen, die für die allgemeine Nutzung durch Mitgliedsstaaten angenommen wurden. Enthält auch Regeln für INT Karten.</p> <p>Enthält beschreibende Einträge für Feature und Attribute.</p> <p>Contient les spécifications cartographiques de l'OHI pour la réalisation de cartes nautiques avec les symboles et abréviations adoptés pour une utilisation générale par les Etats membres. Contient également des dispositions pour les cartes INT. Contient des descriptions pour les Features et les attributs.</p> <p>Geeft kaart specificaties van de IHO voor het samenstellen van nautische kaarten, samen met overeengekomen symbolen en afkortingen aangenomen vooe het algemeen gebruik door lidstaten. Stelt ook eisen voor INT kaarten.</p> <p>Bevat beschrijvende toegangen voor kenmerken en attributen.</p>	3
Meta feature	<p>A feature which contains information about other features.</p> <p>Meta Feature; ein Feature, das Informationen über andere Feature enthält.</p> <p>Metaobjet ; une Feature contenant des informations relatives à d'aures Features.</p> <p>Metaobject; een kenmerk dat informatie bevat over andere kenmerken.</p>	2
Navigation Mode	<p>Means the use of the Inland ECDIS for conning the vessel with overlaid radar image.</p> <p>Navigationsmodus; Verwendung des Inland ECDIS beim Steuern des Schiffes mit überlagertem Radarbild.</p> <p>Mode navigation ; l'utilisation du système ECDIS intérieur pour la conduite du bateau avec superposition de l'image radar.</p> <p>Navigatie modus; het gebruik van Inland ECDIS bij het sturen van het schip met overlapt radar-beeld.</p>	4.1
North-up display	<p>Information shown on the display (radar or ECDIS) with the north direction upward.</p> <p>nordorientierte Anzeige ; auf dem (Radar oder ECDIS) Bildschirm angezeigte Informationen mit Norden nach oben.</p> <p>Affichage au nord ; Information affichée à l'écran (radar ou ECDIS) avec orientation au nord en haut de l'écran.</p> <p>Weergave van north-up; informatie getoond op de monitor (radar of ECDIS) met de noord richting naar boven.</p>	2
Other navigational information	<p>Navigational Information not contained in the SENC, that may be displayed by an ECDIS, such as radar information.</p> <p>Nautische Information, die nicht in der SENC enthalten ist, aber durch ECDIS angezeigt werden kann, wie Radarinformation.</p> <p>Autre information nautique ; information nautique non contenue dans la SCEN mais pouvant être affichée par le système ECDIS, par exemple l'information radar.</p> <p>Nautische informatie, die niet in de SENC is opgenomen, maar door ECDIS kann worden weergegeven, zoals radarinformatie.</p>	2

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
Overscale	Displaying data at a larger scale than it was compiled for. Datenanzeige in einem größeren Maßstab als ursprünglich bei der Herstellung benutzt. Overscale ; affichage de données à une échelle supérieure à celle retenue lors de la réalisation. Gegevens weergave in een grotere schaal dan waarvoor het was gemaakt	2
Own-ship	The term which identifies the vessel upon which an ECDIS is operating. Eigenes Schiff; Begriff für das Schiff auf dem man sich gerade befindet und auf dem ECDIS ausgeführt wird. Propre bateau ; désigne le bateau sur lequel se trouve l'opérateur et à bord duquel le système ECDIS est en cours d'utilisation. Eigen schip; de term die het schip identificeert waarop man zich bevindt en waarop de ECDIS werkzaam is.	2
Own ship's safety contour	The contour related to the own ship selected by the mariner from the contours provided for in the SENC, to be used by ECDIS to distinguish on the display between the safe and the unsafe water, and for generating anti-grounding alarms. Schiffseigene Sicherheitskontur, Sicherheitstiefenlinie; die Tiefenlinie, die der Schiffsführer von den Konturen ausgewählt hat, die in der SENC enthalten sind; verwendet, um auf der ECDIS-Anzeige zwischen sicherem und unsicherem Fahrwasser unterscheiden zu können und zum Erzeugen von Fehltiefen-Alarmen. Contours de sécurité du propre bateau ; ligne de profondeur de sécurité; la ligne de profondeur sélectionnée par le batelier en fonction de l'enfoncement de son propre bateau parmi les lignes de profondeur disponibles dans la SCEN; utilisé afin de faire la distinction dans le système ECDIS entre les eaux sûres ou présentant un risque et pour la génération d'alarmes en présence de hauts-fonds. Veiligheidscontour van het eigen schip, die de schipper uit de dieptelijnen in de SENC heeft gekozen, om te worden gebruikt in ECDIS om bij de weergave veilig en onveilig vaarwater te kunnen onderscheiden en om alarmen te genereren te oorkoming van aan de grondlopen.	2
Performance standard for ECDIS	Standard developed under the authority of IMO to describe the minimum performance requirements for navigational devices and other fittings required by the SOLAS Convention. Adopted by IMO 23 November 1995 as Assembly resolution and published as Annex to IMO Resolution A19/Res 817 (15 December 1995). Leistungsstandard für ECDIS; unter Federführung der IMO entwickelter Standard zur Beschreibung der Mindestleistungsanforderungen für Navigationsgeräte und andere Ausrüstungen laut Anforderung aus der SOLAS-Vereinbarung. Standard de performances pour ECDIS ; standard élaboré dans le cadre de l'OMI pour décrire les exigences minimales relatives aux performances pour les appareils de navigation et d'autres équipements conformément aux exigences de la convention SOLAS. Standaard ontwikkeld onder de bevoegdheid van de IMO om de minimum voorstellings vereisten voor navigatie middelen en andere hulpmiddelen vereist door de SOLAS Conventie. Geadopteerd door de IMO 23 november 1995 als Assembly resolutie en gepubliceerd als bijlage bij de IMO resolutie A 19/ Res 817 (15 december 1995).	2

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
Pick report (feature report)	<p>The result of querying a displayed point-symbol, line or area for further information from the data base which is not represented by the symbol.</p> <p>Auswahl-Bericht, Feature-Bericht; das Ergebnis einer Datenbankabfrage bzgl. dargestellter Punkt-Symbole, Linien oder Flächen, um weitere Informationen zu gewinnen, die nicht unmittelbar aus der Darstellung entnehmbar sind.</p> <p>Pick report ; résultat de la consultation d'un symbole, un point, une ligne ou une aire, pour l'obtention à partir de la base de données d'informations supplémentaires non fournies par le symbole.</p> <p>Kenmerkbericht; het resultaat van de bevraging van een weergegeven punt symbool, lijn of gebied voor verdere informatie van de database die niet wordt weergegeven door een symbool.</p>	2
Presentation library for ECDIS	<p>A set of mostly digital specifications, composed of symbol libraries, colour schemes, look-up tables and rules, linking every feature and attribute of the SENC to the appropriate presentation of the ECDIS display. Published by IHO as Appendix 2 of its Special Publication No. 52 (S-52).</p> <p>Darstellungsbibliothek für ECDIS; Satz von meist in Zeichen und Zahlen verschlüsselten Anforderungen, zusammengestellt aus Symbolbibliotheken, Farbschemata, Nachschlagetafeln und Regeln, der jedes Feature und jedes Attribut der SENC zu einer nach IHO-S-57, Anhang 2 geeigneten Darstellung in der ECDIS-Anzeige verkettet.</p> <p>Bibliothèque des visualisations pour ECDIS ; série d'exigences généralement codées en signes et en lettres, composées à partir de bibliothèques de symboles, de schémas de couleurs, de tables de recherche et de règles, associant chaque Feature et attribut de la SCEN à une représentation appropriée affichée par le système ECDIS conformément à l'appendice 2 au document S-57 de l'OHI.</p> <p>Weergave bibliotheek; een set van digitale specificaties, samengesteld uit symboolbibliotheken, kleurenschema's, naslagtabellen en regels, die elke objectenklasse en elk attribuut van de SENC voor de geeignende weergave van het ECDIS systeem, gepubliceerd door de IHO als appendix 2, S 52</p>	2
Product specification	<p>A defined subset of the entire specification combined with rules, tailored to the intended usage of the transfer data.</p> <p>(The ENC Product specification specifies the content, structure and other mandatory aspects of an ENC.)</p> <p>(Die ENC Produktbeschreibung spezifiziert den Inhalt, die Struktur und andere Erfordernisse einer ENC.)</p> <p>Spécification de produit ; partie définie d'une spécification complète associée à des prescriptions/règles et adaptée au transfert de données prévu.</p> <p>Een gedefinieerde subset van de gehele specificatie gecombineerd met voorschriften afgestemd op het bedoelde gebruik van de overdrachtsgegevens.</p> <p>De ENC produkt specificaties specificieert de inhoud, de structuur en andere verplichte aspecten van een ENC).</p>	2
(Radar) range	<p>Distance from the radar antenna. For inland navigation the radar range has to be sequential switchable according to the CCNR Radar Regulations.</p> <p>(Radar-)Bereich; Abstand von der Radar-Antenne. In der Binnenschifffahrt muss der (Radar-)Bereich sequentiell schaltbar entsprechend den ZKR-Radar-Vorschriften sein.</p> <p>Distance par rapport à l'aérien du radar ; pour la navigation intérieure, la portée doit être commutable de manière séquentielle conformément à la réglementation de la CCNR relative aux appareils radar.</p> <p>Afstand t.o.v. de radarantenne. Voor de binnenvaart de radar afstand moet ononderbroken geschakeld kunnen worden overeenkomstig de CCR radar voorschriften.</p>	9

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
Relative motion display	<p>An ECDIS function in which the area is displayed which is needed to study the intended route, to select the intended track, and to mark the track, its way points and navigational notes.</p> <p>Anzeige der relativen Bewegung; zeigt Karteninformation und Radarobjekte in relativer Bewegung zur Schiffposition, die auf dem Bildschirm fixiert ist.</p> <p>Affichage du mouvement relatif ; affiche à l'écran en mouvement relatif des informations cartographiques et des objets détectés par le radar par rapport à la position du bateau présentée à l'écran.</p> <p>Weergave van de relatieve beweging; toont kaartinformatie en radarobjecten in relatieve beweging tot de scheepspositie, dat op het beeld is vastgelegd.</p>	2
Route planning	<p>An ECDIS function in which the area is displayed which is needed to study the intended route, to select the intended track, and to mark the track, its way points and navigational notes.</p> <p>Fahrtroutenplanung; ECDIS-Funktion, in der das Gebiet angezeigt wird, was benötigt wird um die vorgesehene Route zu studieren, die vorgesehene Fahrspur auszuwählen und zu markieren, ihre Meilensteine (Brechpunkte) und navigatorisch bedeutsame Bemerkungen.</p> <p>Planification de l'itinéraire ; une fonction ECDIS affichant le secteur requis pour l'étude de l'itinéraire, le choix du chenal et pour le marquage de la route, de ses repères et d'observations nautiques utiles.</p> <p>Route planning; een ECDIS functie waarin het gebied weergegeven wordt, dat nodig is om de geplande route te bestuderen, de geplande koers te kiezen en de way-points en de bemerkingen voor de navigatie te markeren.</p>	1
SCAMIN	<p>The minimum scale at which the feature may be used e.g. for ECDIS presentation.</p> <p>Der kleinste Maßstab, in dem ein Objekt in ECDIS angezeigt werden darf.</p> <p>La plus petite échelle avec laquelle l'affichage d'un objet est autorisé dans une représentation ECDIS.</p> <p>De kleinste schaal waarin een object in ECDIS aangegeven mag worden.</p>	3
SENC	<p>System Electronic Navigational Chart: A data base resulting from the transformation of the ENC by ECDIS for appropriate use, updates to the ENC by appropriate means and other data added by the mariner. It is this data base that is actually accessed by the ECDIS for the display generation and other navigational functions. The SENC may also contain information from other sources.</p> <p>Herstellerspecifische Elektronische Schifffahrtskarte; Datenbank, die sich aus der Transformation von ENC durch ECDIS für eine geeignete Anwendung ergibt und die durch Aktualisierungen der ENCs mit geeigneten Mitteln und außerdem durch Daten des Schiffsführers ergänzt ist; Datenbank, auf die tatsächlich durch ECDIS für die Erzeugung der Darstellung und anderer nautischer Funktionen zugegriffen wird. SENC kann auch Informationen aus anderen Quellen enthalten.</p> <p>SCEN ; carte électronique pour la navigation intérieure configurée par le fabricant; une base de données résultant de la transformation de la CEN par le système ECDIS en vue d'une utilisation appropriée et complétée par l'actualisation des CEN par des moyens appropriés et par des données ajoutées par le batelier; base de données effectivement consultée par le système ECDIS pour l'élaboration des données affichées et pour d'autres fonctions nautiques. La SCEN peut aussi contenir des informations provenant d'autres sources.</p> <p>Door de fabrikant vervaardigde elektronische kaart voor de binnenvaart. Databank die is gebaseerd op de vertaling van ENC naar ECDIS voor toegepast gebruik en die door actualisering van ENC en bovendien door gegevens van schippers vervolmaakt is. Juist deze informatie wordt gebruikt door ECDIS voor ontwikkeling, presentatie en voor andere nautische functionaliteiten. De SENC kan ook onderdelen uit andere informatiebronnen bevatten.</p>	2

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
Spatial object	<p>An object which contains locational information about real world entities.</p> <p>Räumliches Objekt; Objekt, das für die Geo-Referenzierung von Dingen in der realen Welt sorgt.</p> <p>Objet de localisation ; un objet contenant les informations locales relatives à des unités réelles.</p> <p>Ruimtelijk object; een object dat plaatselijk informatie over de werkelijkheid bevat.</p>	2
Standard display	<p>Standard Information Density means the default amount of SENC information that shall be visible when the chart is first displayed on ECDIS first.</p> <p>Standardanzeige, bedeutet den Standardumfang an SENC-Informationen, der zuerst sichtbar sein muss, wenn die Karte erstmalig in ECDIS angezeigt wird.</p> <p>Affichage standard ; la densité standard des informations de la SCEN devant être visibles en premier lors de l'affichage de la carte par le système ECDIS.</p> <p>Standaard weergave, betekent de omvang van de standaard van SENC informatie, die pas zichtbaar moet zijn wanneer de kaart in ECDIS ordt weergegeven.</p>	4.1
[Vessel] Tracking and Tracing	<p>The function of maintaining status information of the vessel and– if needed – combined with information on cargo and consignments [tracking] and the retrieving of information concerning the whereabouts of the vessel and – if needed – combined with information on cargo, consignments and equipment [tracing].</p> <p>(Schiffs)verfolgung und Aufspürung; die Aufgabe Statusinformationen über ein Schiff aufrecht zu erhalten – falls benötigt – in Verbindung mit Informationen über die Ladung und Sendungen [tracking] sowie die Aufgabe der Erkundung des Aufenthaltsortes des Schiffes und – falls benötigt – der Ladung, der Sendungen und der Ausrüstung [tracing].</p> <p>Repérage et suivi des bâtiments (VTT) ; la fonction de maintien de l'information relative au statut du bâtiment et, si nécessaire, de l'information relative à la cargaison, l'envoi [tracking] et l'obtention d'information relative à la localisation du bâtiment et, si nécessaire, de l'information relative à sa cargaison, l'envoi et l'équipement [tracing]</p> <p>Tracking and Tracing van schepen; de functie van onderhouden status informatie van het schip en indien noodzakelijk gecombineerd met informatie over lading en verzending [tracking] en het herstel van informatie betreffende de verblijfplaats van een schip en indien noodzakelijk gecombineerd met informatie over lading, zendingen en uitrusting [tracing].</p>	10
True motion display	<p>A display in which the own vessel and each radar target moves with its own true motion, while the position of all charted information remains fixed.</p> <p>Anzeige der absoluten Bewegung; eine Anzeige, in der sich das eigene Schiff und jedes Radarziel mit seiner eigenen wirklichen Bewegung fortbewegt, während die Positionen aller kartierten Informationen fixiert bleiben.</p> <p>Affichage du mouvement réel ; un affichage présentant le propre bateau et tout autre cible radar en mouvement réel tandis que la position de toutes les autres informations cartographique demeure fixe.</p> <p>Weergave van ware beweging; een weergave waarin het eigen schip en alle radar doelen bewegen met hun eigen werkelijke snelheid, terwijl de positie van de kaartinfo vast wordt weergegeven.</p>	2
User-defined settings	<p>Means the possibility to use and store a profile of display and operation controls-settings.</p> <p>Benutzerdefinierte Einstellungen; Möglichkeit, ein Profil von Anzeige- und Betriebseinstellungen zu verwenden und zu speichern.</p> <p>Configuration par l'utilisateur ; la possibilité d'utiliser et d'enregistrer une configuration donnée pour les paramètres d'affichage et de fonctionnement.</p> <p>Voor de gebruiker gedefinieerde instellingen; betekent de mogelijkheid om een profiel van weergave en gebruiksinstellingen te gebruiken en vast te leggen.</p>	4.1

Term or abbreviation	Definition	Source
English Deutsch Français Nederlands		
VRM	Variable Range Marker. Variabler Entfernungsmessring. Cercle variable de mesure des distances. Variabele afstandsmetring.	4.5
WGS 84	<p>WORLD GEODETIC SYSTEM: The geodetic basis for the „Navigational Satellite Timing and Ranging - Global Positioning System“ (NAVSTAR-GPS), which enables the surveying of the earth and its entities and was developed by the United States Department of Defense. This global geodetic reference system is recommended by IHO for hydrographic and cartographic use.</p> <p>Weltweites Geodätisches System; die geodätische Basis für das Navigational Satellite Timing and Ranging - Global Positioning System“ (NAVSTAR-GPS), das die Vermessung der Erde und ihrer Dinge ermöglicht und das vom Verteidigungsministerium der USA entwickelt wurde. Dieses globale geodätische Referenzsystem wird von der IHO empfohlen für den hydrografischen und kartografischen Gebrauch.</p> <p>Système géodésique mondial ; La base géodésique pour le "Navigational Satellite Timing and Ranging - Global Positioning System“ (NAVSTAR-GPS), permettant une surveillance de la terre et de ses entités, développé par le Département de la défense des USA. Cette système géodésique global de référence est recommandé par l'IHO pour un usage hydrographique et cartographique.</p> <p>Wereldwijd geodatisch systeem; de geodatische basis voor de „Navigational Satellite Timing and Ranging - Global Positioning System“ (NAVSTAR-GPS), dat het mogelijk maakt de aarde en haar entiteiten te onderzoeken en dat was ontwikkeld door de USA (defensie). Dit wereldomvattende geodatische referentiesysteem wordt aanbevolen door de IHO voor hydrografisch en kartografisch gebruik.</p>	6