Leaflet

Inland ECDIS

Leaflet
Edition 2011

Inland ECDIS

"Electronic Chart Display and Information System" for Inland Navigation

Contents

1. Basis

1.1 Purpose

Inland ECDIS is a system for the display of electronic inland navigation charts and additional information. Its purpose is to contribute to the safety and efficiency of inland navigation and thus also to the protection of the environment. Inland ECDIS is used simultaneously to reduce the workload when navigating the ship as compared to traditional navigation, and for information methods. Inland ECDIS also provides the basis for other River Information Services (RIS), e.g. Inland AIS.

1.2 Terminology

DGNSS means Differential Global Navigation Satellite System.

ECDIS (*Electronic Chart Display and Information System*) means the international standard for the electronic nautical chart and its display, as defined by the IMO, the IHO and the International Electrotechnical Commission (IEC) for the electronic nautical chart and its display.

IALA is the abbreviation for International Association of Marine Aids to Navigation and Lighthouse Authorities.

IHO is the abbreviation for International Hydrographic Organization.

IMO is the abbreviation for International Maritime Organisation.

Inland ECDIS means the standard for ECDIS on inland shipping routes as established by the Central Commission for the Navigation of the Rhine (CCNR), the Danube Commission (DC), the European Community (EC) and the United Nations Economic Commission for Europe (UN/ECE). Inland ECDIS uses the stipulations of the maritime ECDIS and supplements them, but does not amend them.

Inland ECDIS application is either an independent device or a software running on a standard personal computer (PC). An Inland ECDIS application conforms to this standard and is used for the display of Inland ENCs.

Inland ENC means the electronic inland navigation chart in ECDIS. It contains all essential chart information and additional information that may be of use to shipping (feature data).

Inland SENC means the producer-specific electronic inland navigation chart. It is created by converting the Inland ENC into a producer-specific format. The Inland SENC can be copy-protected.

1.3 ECDIS features

The electronic chart developed according to the ECDIS standard differs fundamentally from a paper chart. Its presentation on a screen has some advantages over a paper chart.

These are based on the following principles:

- Object oriented presentation with area objects (e.g. land surfaces), line objects (e.g. banks) and point objects (e.g. buoys).
- Arrangement of the objects in a database, making it possible to assign feature data (attributes) to each object.
- Vector presentation instead of raster presentation; lines thus retain their thickness and point objects retain their size when zooming. The vector data files are small in comparison to raster data.
- There are at least three levels of information density: all, standard, minimum (and user defined).
- A scale is allocated to each object type so that the object disappears when zooming out. This prevents charts being overloaded with information.
- Text is always displayed upright independent of the chart orientation.
- The radar image can be underlaid with the chart.
- When navigating the chart can be positioned and oriented automatically in accordance with the ship's heading. For this purpose, satellite positioning either with correction data (DGNSS) or without correction data (GNSS) can be used.
- Restrictions of depth, width or vertical clearance, network data and operating times of infrastructure can be used by voyage planning applications.
- Information which is distributed in accordance with the standard for Notices to Skippers can be connected to the affected objects in the charts, displayed and used for voyage planning. Standardized location codes are used to connect the different types of information.
- Information which is distributed in accordance with the standard for Inland AIS (e.g. position of other vessels) can be displayed.

1.4 Supplementary features of Inland ECDIS

Compared with the maritime ECDIS the Inland ECDIS comprises supplementary features:

- Objects specific to inland shipping such as aids to navigation (e.g. notice marks).
- Display of notice marks e.g. in a separate window of the object report (pick report).
- Display of the notice marks on bridges in accordance with the aspect angle to the bridge.
- Two new operation modes, namely the "navigation mode" and the "information mode" instead of the "route monitoring" and "route planning" modes in the maritime ECDIS,
- Display of depth information related to the actual water level (if provided in a standardized data exchange format).

The electronic display of the chart is only one aspect of ECDIS. Inland ECDIS is also an information system, which enables its users to recall other information about the displayed objects besides their graphics presentation.

2. Inland ECDIS standard

2.1 Purpose

The Inland ECDIS standard provides a uniform basis for the use of electronic inland navigation charts and for the use of telematics applications such as Inland AIS transponders or other methods of identifying, tracing and tracking of vessels on inland waterways. It contains the technical and operational requirements, testing methods and required test results for Inland ECDIS applications.

2.2 Legal basis

- Resolutions of the Central Commission for the Navigation of the Rhine of 31 May 2001 and 23 November 2006: “Standard Electronic Chart Display and Information System for Inland Navigation (Inland ECDIS Standard)” (protocol 2001-I-16 and protocol 2006-II-22).
- Resolution No. 48 of the UN/ECE (ECE/TRANS/SC.3/156/Rev.1) as amended.
- Commission Regulation defining the technical specifications for the electronic chart display and information system for inland navigation (Inland ECDIS) in accordance with Directive 2005/44/EC of the European Parliament and the Council.
- Recommendation of the 73rd Session of the Danube Commission DK/TAG 73/9.

2.3 Current edition

The current edition of the Inland ECDIS Standard contains the text in the English, Dutch, French and German languages and is published in the internet under www.ccr-zkr.org.

The current status of the Product Specification for Inland ENCs including the Inland ENC Feature Catalogue and the Inland ENC Encoding Guide and the Presentation Library, the symbols and lookup-tables are published in the internet under http://ienc.openecdis.org .

While edition 1.02 of the Inland ECDIS Standard has been a purely European standard, edition 2.0 and later editions are international standards. The data standard is also applied in North and South America and the Russian Federation, and is open for use in other regions of the world.

2.4 Regulations for Inland ECDIS equipment

For inland ECDIS equipment, which can be operated in the navigation mode there are requirements concerning its design, its functionality and its operation. These requirements are

- parts of the Inland ECDIS Standard itself and
- the “Requirements for the installation and the functional tests of navigational radar equipment and rate of turn indicators in Rhine navigation” adopted by the CCNR concerning
  - the minimum requirements,
  - the required test results,
  - the installation and
  - the performance tests.

2.5 Structure of the Inland ECDIS standard

The Inland ECDIS standard comprises the following sections:

Section 1 "Performance standard" – redrafted in accordance with IMO Resolution MSC.232(82).

Section 2 "Data standard for Inland ENCs" – complements IHO Standard S-57.

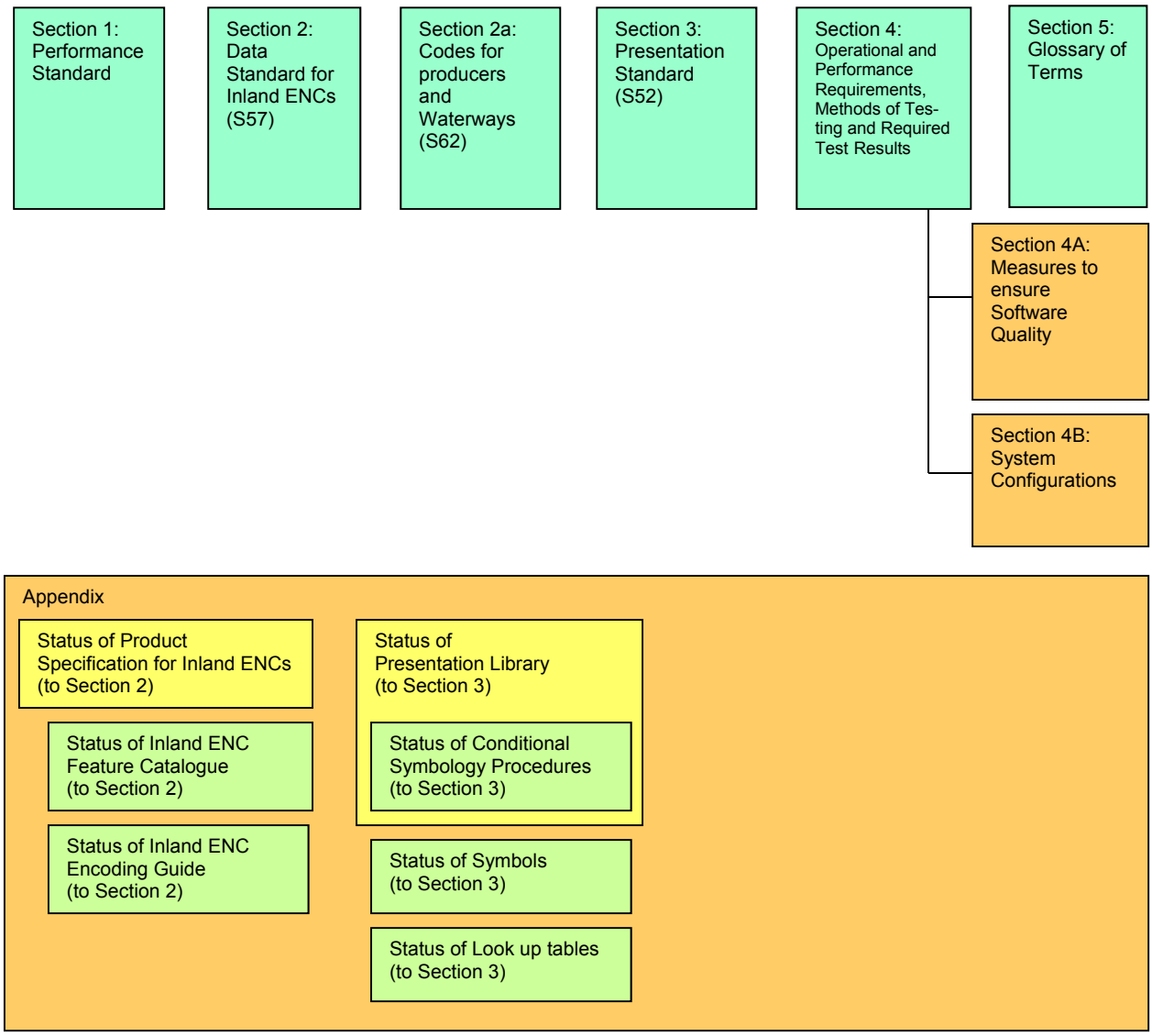
Section 2a "Codes for producers and waterways" – complements IHO Standard S-62.

Section 3 "Presentation standard" – complements IHO Standard S-52.

Section 4 "Operational and performance requirements, methods of testing and required test results" – redrafted in accordance with IEC Guideline 61174.

Section 5 "Glossary of terms" – redrafted in accordance with IHO Standard S-32, Appendix 1.

Structure of the standard



2.6 Compatibility with the maritime ECDIS

Maritime ECDIS and Inland ECDIS are based on the same software specifications, but use different Feature Catalogues, Lookup Tables, Symbol Libraries and Conditional Symbology Procedures. If both sets of these digital parts are installed in an application, it is able to display maritime ENCs and Inland ENCs. ECDIS applications that contain only the object catalogue and the presentation library of the maritime ECDIS do not display the object types that have been added for the inland waterways.

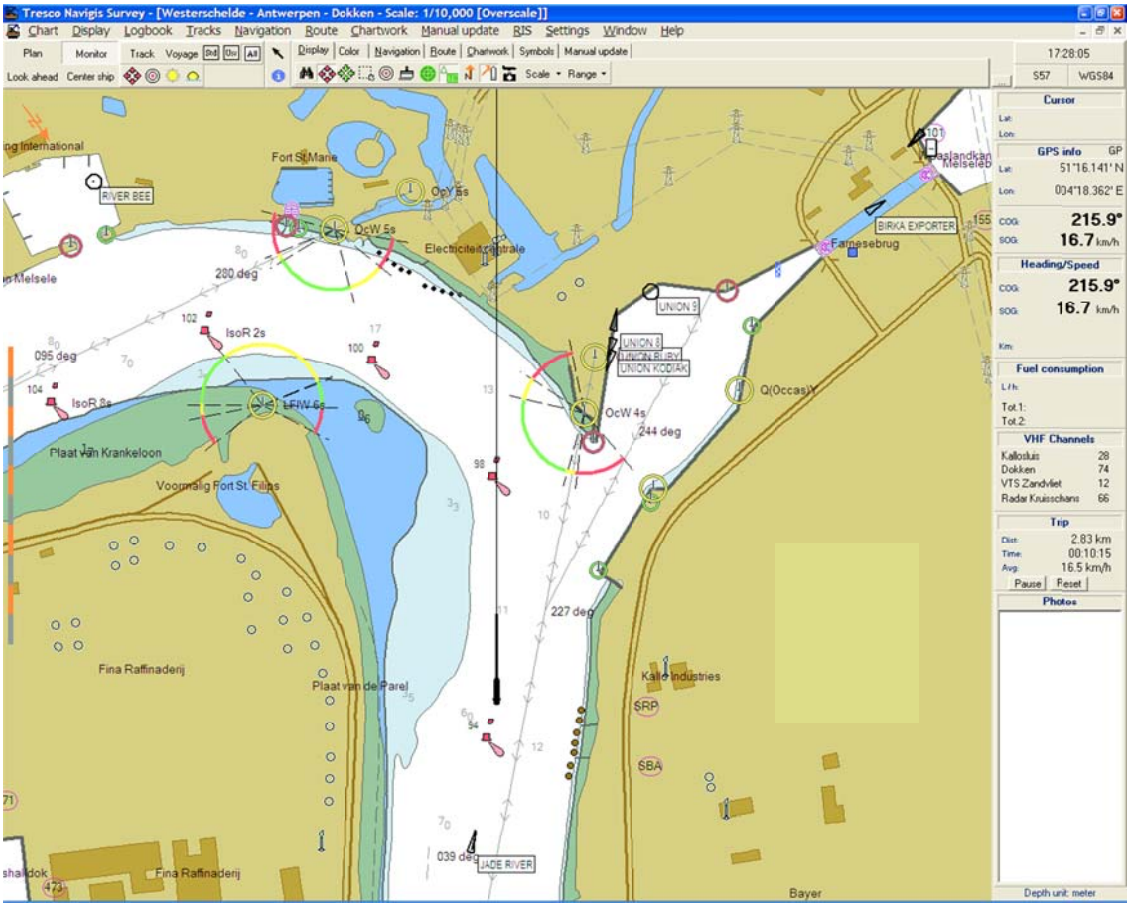
The Inland ENC Harmonization Group (IEHG), which is composed of representatives of European countries, the United States of America, the Russian Federation, Brazil, China and South Korea, international organisations, private companies, user groups and experts at the moment, is recognized as the competent expert group for Inland ENC standardisation by IHO and is participating in the working group of IHO for the development of future ENC standards.

3. Operation modes

3.1 Information mode

In the information mode, Inland ECDIS equipment acts as an electronic atlas and serves to guide and to provide information about the waterway. It is not intended to navigate the vessel. When connected to a positioning sensor the chart picture can be adjusted automatically in a way that the ship's own position is fixed in the centre of the screen. It is also possible to display other vessels, which are equipped with Inland AIS, if the application is connected to an Inland AIS transponder.

For Inland ECDIS equipment and applications that are destined for the information mode only, the requirements of the Inland ECDIS standard are to be understood as a recommendation.

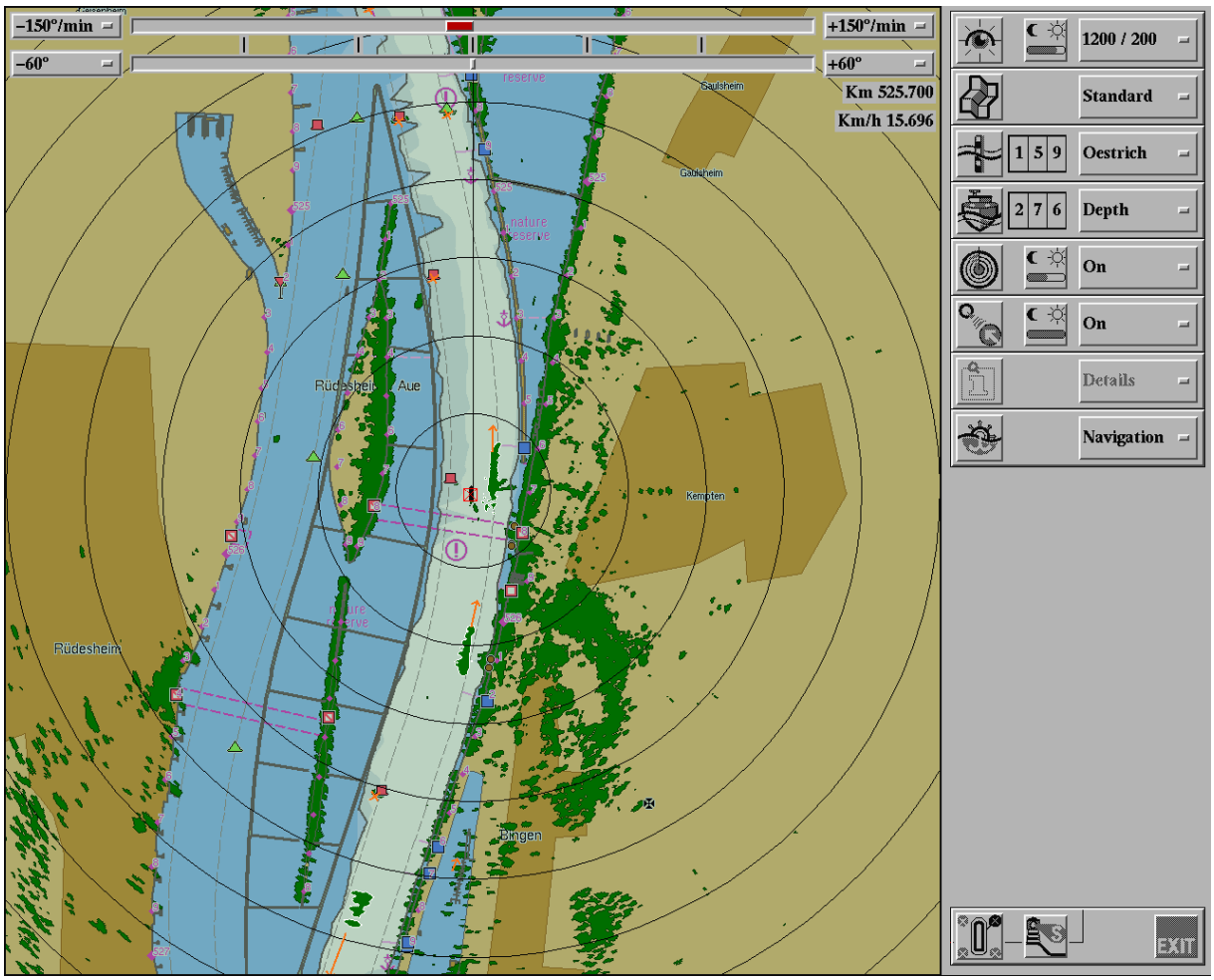


Example: Inland ECDIS in information mode

3.2 Navigation mode

Navigation mode means the use of the Inland ECDIS for conning the vessel by using radar and underlaid chart image. Inland ECDIS equipment being able to operate in the navigation mode means radar equipment as defined by the regulations concerning the minimum requirements and test conditions for radar installations used for Rhine navigation and requires type test and approval. The vessel's position must be derived from a continuous positioning system whose accuracy is consistent with the requirements of safe navigation. The position and heading determination must meet the requirements as defined in Section 4A, No. 2.1 of the standard.

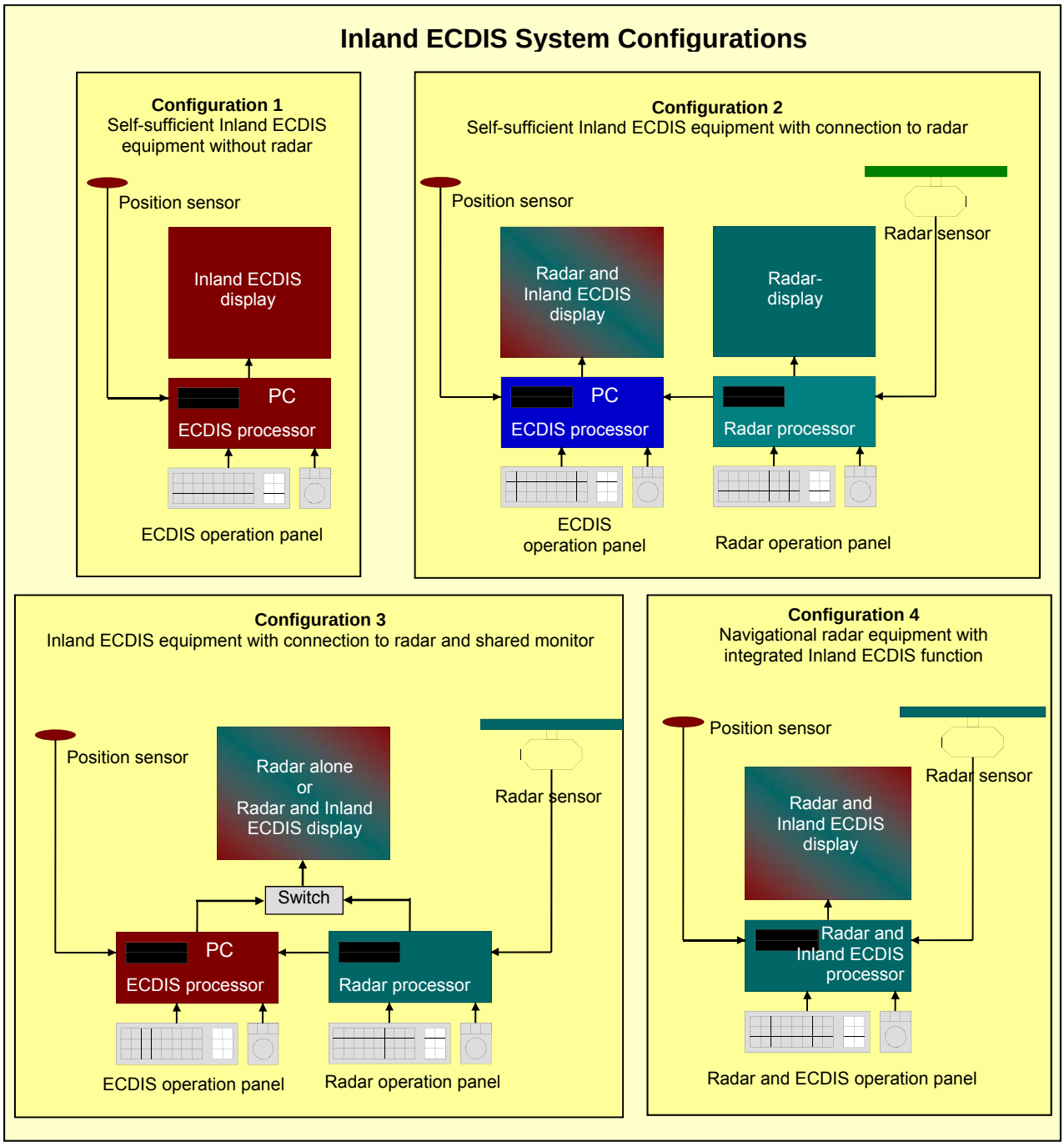
Anyone, who uses an Inland ECDIS device in the navigation mode, must have a radar license.



Example: Inland ECDIS in navigation mode (Rhine near Rüdesheim)

4. Configurations of Inland ECDIS equipment

With regard to future developments, the standard includes four system configurations:



In configuration 1, only operation in the information mode is possible. In configurations 2 and 3, the Inland ECDIS equipment extends the functions of radar equipment. These configurations can be operated in the information mode as well as in the navigation mode. They differ only in regard to the number of displays. If only one display is used (configuration 3), the radar image can either be displayed alone or with an underlaid chart. In configuration 4, the functions of the Inland ECDIS are integrated into the radar equipment.

5. Conformity tests for Inland ECDIS equipment and applications

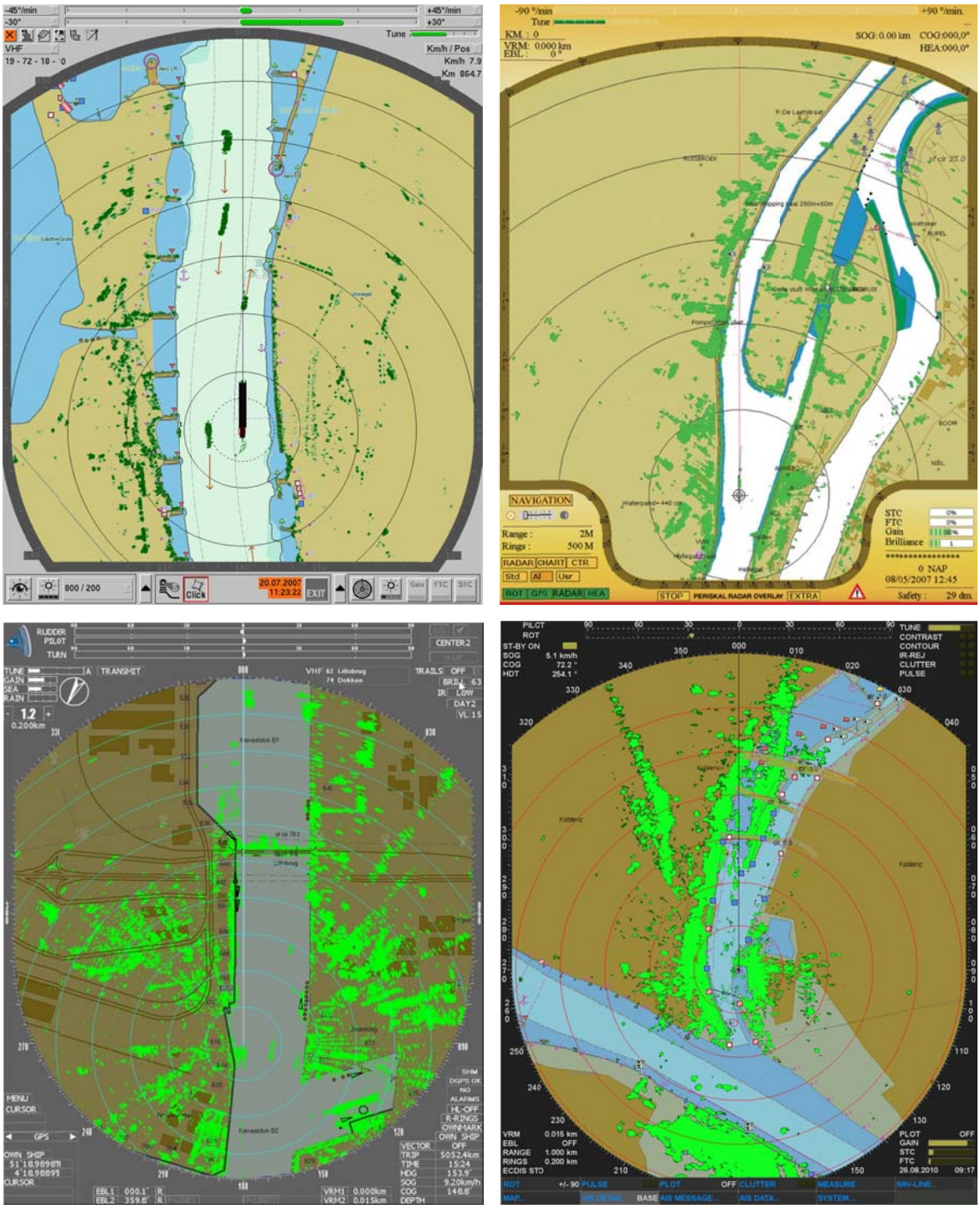
5.1 Inland ECDIS equipment for the information mode

Inland ECDIS equipment and applications for the information mode (configuration 1) do not need type approval. The producer verifies on the basis of the Test-Inland-ENC included in the applicable Inland ECDIS standard whether all types of objects are displayed completely and correctly. The Wasser- und Schifffahrtsdirektion Südwest, Fachgruppe Telematik Binnen, and Rijkswaterstaat DVS provide support in this regard.

5.2 Inland ECDIS equipment for the navigation mode

Inland ECDIS equipment and applications for navigational use are tested and approved by the competent authority (type approval). They are published on the CCNR internet page, www.ccr-zkr.org.

Competent authority:
Fachstelle der Wasser- und Schifffahrtsverwaltung des Bundes für Verkehrstechniken, Am Berg 3, D-56070 Koblenz, Germany, (www.fvt.wsv.de).



Examples of Inland ECDIS in navigation mode

6. Contents of the electronic chart (Inland ENC)

If the chart is intended to be used for the navigation mode, at least the following object types have to be included in the ENC:

- shoreline (at mean water level),
- shoreline construction (breakwater, longitudinal control dam),
- contours of locks and dams,
- boundaries of the fairway (if available),
- isolated danger spots in the fairway below and above water level, such as subways, bridges, overhead wires, etc.,
- buoys, beacons, lights, notice marks,
- waterway axis with kilometre and hectometre indications,
- location of ports and transhipment sites,
- reference data for water level gauges relevant to navigation,
- links to the external xml-files with operation times of restricting structures, in particular locks and bridges.

Moreover, the Inland ECDIS standard makes it possible to display numerous other object types and to describe them with feature data.

7. Producing and testing the Inland ENCs

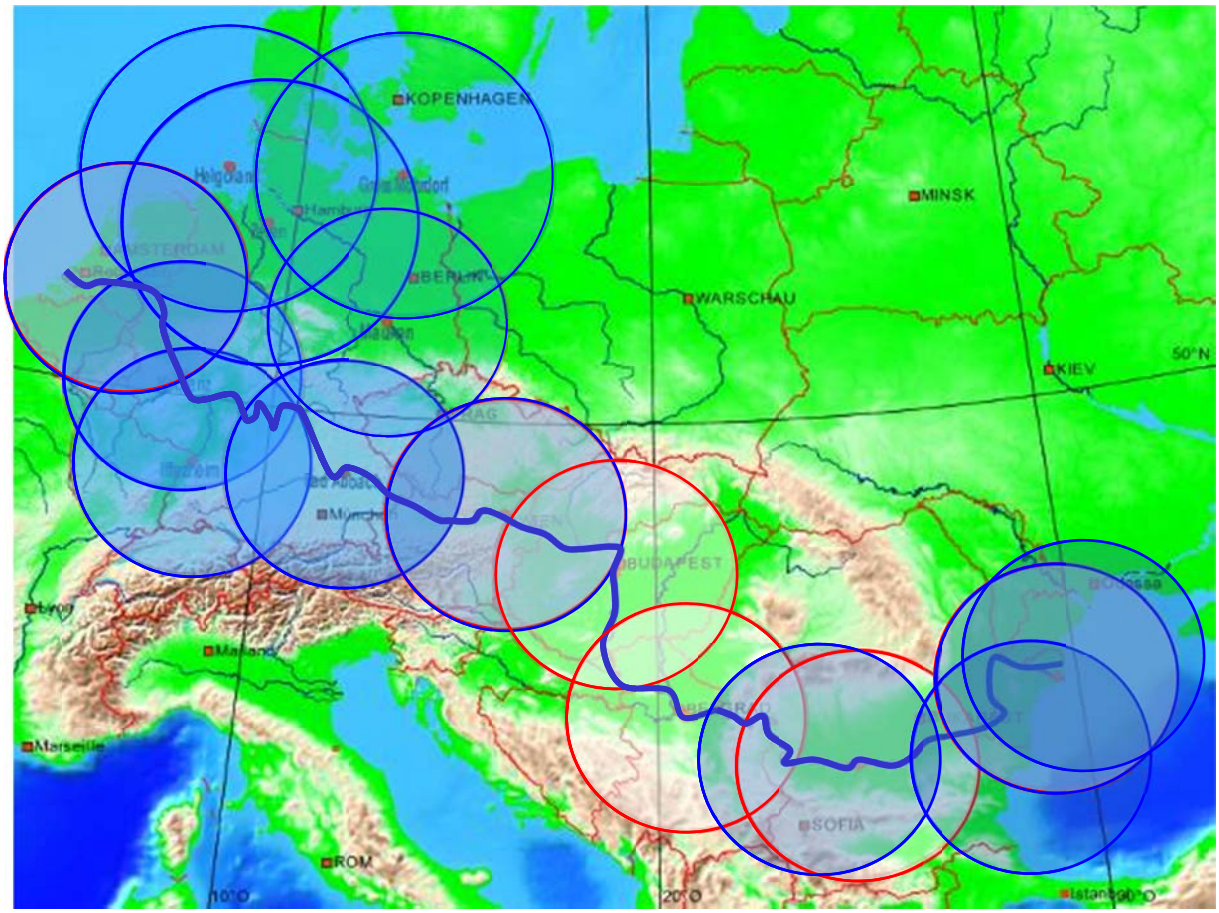
Inland ENCs can be produced, updated and published by commercial manufactures as well as by waterways administrations.

For use in navigation mode official Inland ENCs are required. Type approved Inland ECDIS equipment indicates the status of the Inland ENCs when used in navigation mode.

Commercially manufactured Inland ENCs for the navigation mode including their updates, must be tested and cleared for release by the competent authority prior to their publication. This authority decides for each waterway, which object types must be verified and declares, which Inland ENCs are suitable for the navigation mode.

8. The use of IALA DGNSS on inland waterways

In order to identify the position of one's ship and, thus, for the positioning of the electronic river chart, a satellite-based navigation system is required. At the moment, a GPS navigation system is available throughout Europe. Its accuracy is sufficient for strategic navigation and for the information mode of Inland ECDIS equipment. The accuracy of chart positioning is subject to more stringent requirements in the navigation mode, which cannot be complied with, without a differential service. Therefore the IALA DGNSS service is provided. IALA DGNSS reference stations along major inland waterways in Europe are planned or already provided.



IALA DGNSS beacon coverage (planned or already in service) along major inland waterways in Europe.

Blue Circles: IALA DGPS Reference station already in operation;
Red Circles: IALA DGPS Reference station planned.

The IALA service can only be used with special receivers. The correction signal can also be distributed via Inland AIS base stations. If the vessel is equipped with Inland AIS, it does not need an IALA receiver in an area with AIS base stations.

9. Inland ECDIS data production

9.1 Austria

Inland ENCs for the Austrian section of the Danube are published by the Federal Ministry of Transport, Innovation and Technology and via donau and are available (free download) on the homepage www.doris.bmvit.gv.at. The charts are based on edition 2.1 of the Inland ECDIS standard. Depth values are based on RNW 96 (low water level according to the recommendations of the Danube Commission). They represent the situation at the time of measurement. As the riverbed is subject to ongoing natural changes especially in the free flowing sections of the Danube, liability for the depths values cannot be assumed; depths data are intended for information purposes only.

As different offices are responsible for geographical data and traffic regulations, two files are made available for each section. The basic cell with geographic information and the overlay cell with traffic regulations can be displayed simultaneously in Inland ECDIS applications.

The charts cover the Austrian section of the Danube, the sections of the Traun, Enns and March, which are international waterways and the Danube Canal in Vienna.

Charts with detailed information about the infrastructure in ports were developed together with the port operators.

Updates are published under the internet address as stated above, where interested parties can also register for a free message service via e-mail.

All published Inland ENCs are appropriate for navigation.

9.2 Belgium

Coastal area: The Flemish banks are fully mapped and the part of the Westerscheldt between the Dutch/Belgian border and the Rupel mouth is 80 % completed. These activities are also linked to the IHO, based on the IMO-standards.

Inland waterways: All charts for waterways (CEMT class IV or higher) in Flanders are converted into S57 charts and distributed since May 2010. NV De Scheepvaart and Waterwegen en Zeekanaal NV, have started further conversions of charts for some waterways (CEMT class III) into S57 charts. NV De Scheepvaart planned a first update of the Albertcanal in 2011, because of large changes in the infrastructure.

Ports: The Cell 'Inland ENC' of the Agency for Maritime and Coastal Services – Flemish Hydrography started in 2010 with the production of the specific charts for Inland navigation for its jurisdiction. In addition, the Flemish Hydrography produces the IENC for the harbours Ghent, Zeebruges and Ostend:

- finalised in 2010, IENC Canal Ghent-Terneuzen adjacing harbour Ghent;
- planned in 2011 and 2012, coastal area (5-miles zone for Estuary Navigation) between Zeebruges and the Westerscheldt including the harbour of Zeebruges, Westerscheldt between the Dutch/Belgian border and the Rupel mouth (lock of Wintam);
- planned in 2012, the harbour Ostend.

Overview:

Waterways	# km
Gent-Terneuzen canal (from Gent to the Meulestede bridge)	2.268
Gent-Terneuzen canal (from the border to the Meulestede bridge)	
Handelsdok	1.625
Ring canal Gent	21.683
Bovenschelde (from Oudenaarde to the Ring canal)	14.562
Moervaart	3.200
Gent-Oostende canal (from the Ring canal to Schipdonk)	6.827
Gent-Oostende canal (from Brugge to the new Plassendale bridgein Oostende)	16.864
Boven-Zeeschelde	29.990
Beneden-Zeeschelde	30.750
Rupel	11.980
Netekanaal	5.683
Kanaal Brussel-Schelde	27.008
Dok van Vilvoorde	1.525
Albertkanaal	109.682
Schelde-Rhine connection	8.000
Dessel-Kwaadmechelen canal	15.785
Zuid-Willemsvaart	42.00
Bocholt-Herentals	31.00

Ports	Status
Zeebrugge	2012
Oostende	2012
Gent	2010
Antwerp	2011 (finished)

All Flemish charts can be downloaded free of charge from the website ris.vlaanderen.be.

Westerscheldt River: Flanders and the Netherlands co-operate in the nautical field for the Westerscheldt River area in order to ensure a safe and efficient navigation to and from ports along the (Wester)Scheldt. Management and exploitation is done by “Beheer & Exploitatie Team Schelderadarketen (BET-SRK)”. This means, that the working area of the Westerscheldt River is under the authority of two countries and different authorities are involved. Therefore different competent authorities are involved in the production of Inland ECDIS charts. Afdeling Kust (Flanders) produces the Inland ECDIS charts for the Flemish part. Rijkswaterstaat does this for the Dutch part.

The Inland ECDIS chart for the Flemish part of the Canal Gent-Terneuzen is currently available on nts.flaris.be. Depth information is included in the charts. The following depth areas are provided: - 5 m till 0 m (dry falling area), 0 m – 2 m, 2 m – 5 m, 5 m – target depth. Finalization of the IENC Scheldt River (Antwerp – Wintam) is planned for July 2011. The Dutch part IENC of the Scheldt River is already available: www.risserver.nl.

Because the Westerscheldt River is a mixed zone consisting of maritime and inland navigation, special measures have been taken to keep consistency between the maritime ECDIS charts and the Inland ECDIS charts (same depth areas …).

The produced Inland ECDIS Charts for the Westerscheldt River area will be publicly available (free download), using a distribution system on the RIS (FIS) Portal www.vts-scheldt.net. Updates will also be published on this website. Notifications using a mailing list system will be foreseen.

9.3 Bulgaria

Inland ENCs for the Danube are under preparation.

9.4 Croatia

Inland ENCs for the Danube, Sava and Drava are available at www.crup.hr free of charge. Conversion of the data to the current edition of the standard is in preparation.

9.5 Czech Republic

Inland ENCs for the Elbe and Vltava are available for download at www.lavdis.cz free of charge. The competent authority for the issuing of ENCs is the State Navigation Authority.

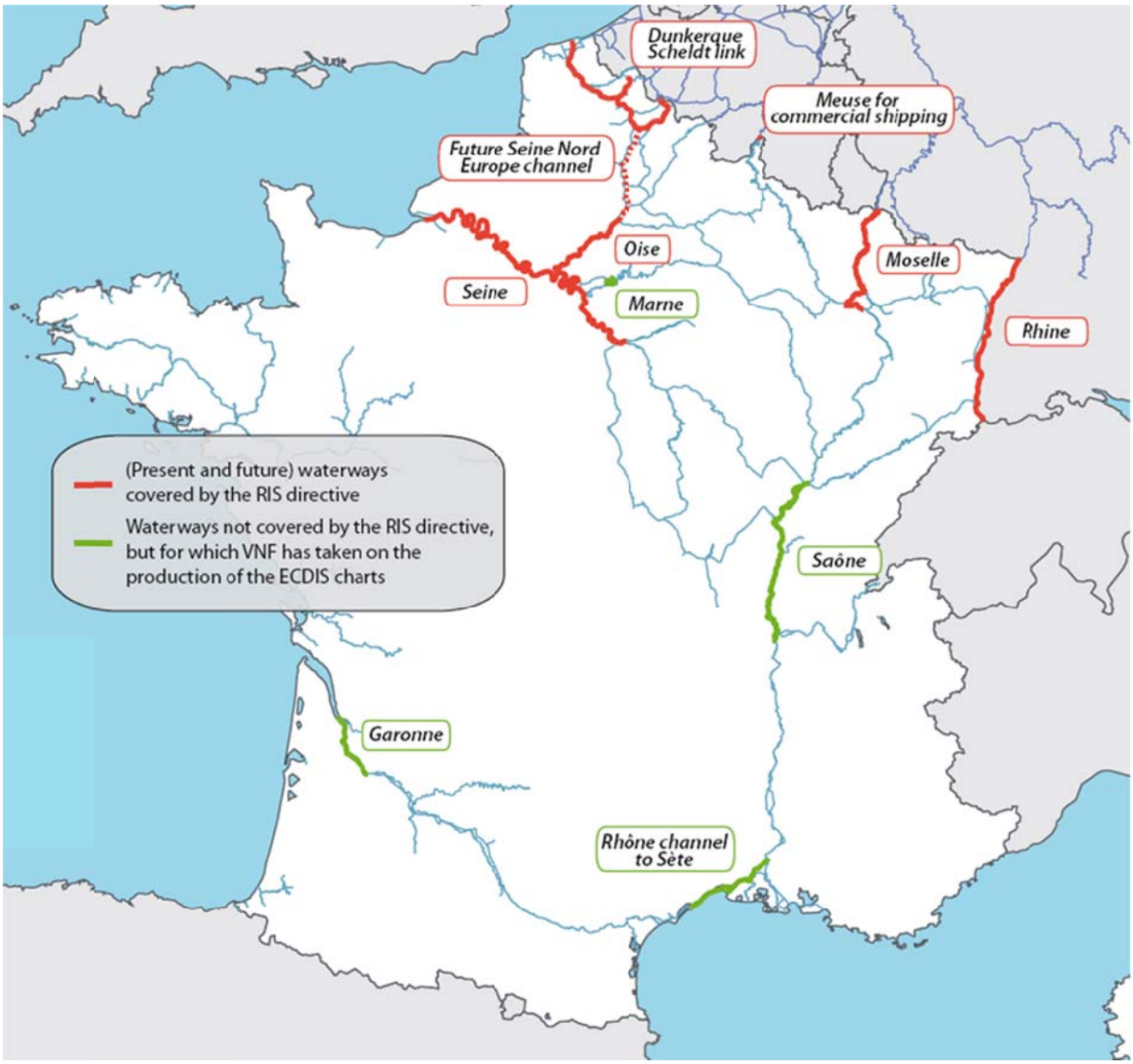
9.6 France

Inland ENCs produced by Voies navigables de France (VNF) are available free of charge. They can be downloaded via the VNF website at
http://www.vnf.fr/vnf/content.vnf?action=rubrique&rub_id=1830

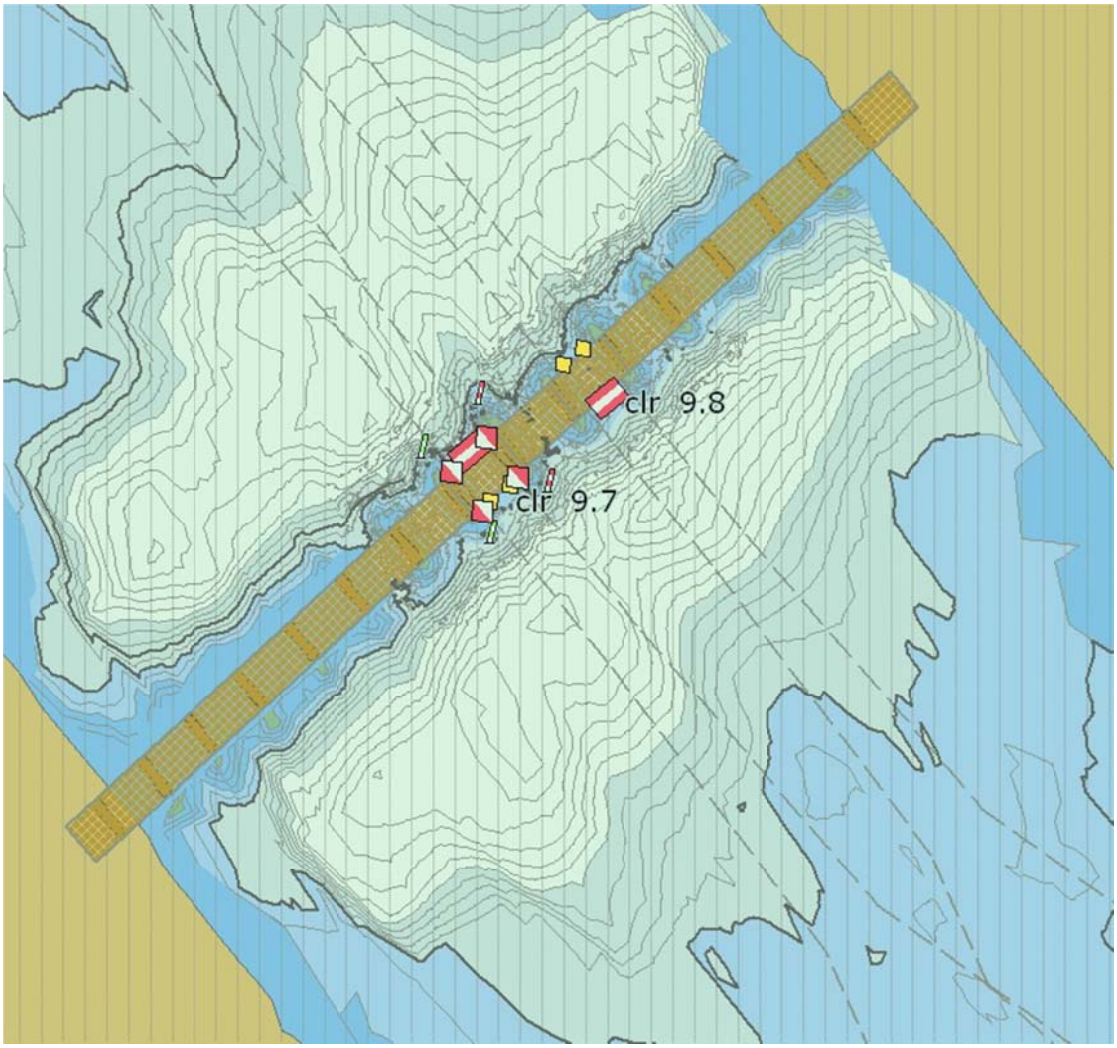
Presently, the VNF website provides finalised Inland ENCs of the **Dunkerque Scheldt link** (160 km) and the **Garonne** (55 km). The bathymetry of the ENC of the Garonne is to be updated in 2012.

Inland ENCs of the **Moselle** (160 km), the **Franco-German Rhine** (drawn up in cooperation with the Wasser- und Schifffahrtsdirektion in Germany) and the **Saône** (219 km) are currently being produced. These ENCs are expected to be finalised early in 2012.

The production of ENCs for the Seine and Oise will start in 2012.



Programme covering the French waterway network by Inland ENCs



ENC of the Garonne (Pont de Pierre)

9.7 Germany

Publisher:
Wasser- und Schifffahrtsverwaltung des Bundes (WSV) (Federal Waterways and Shipping Administration)

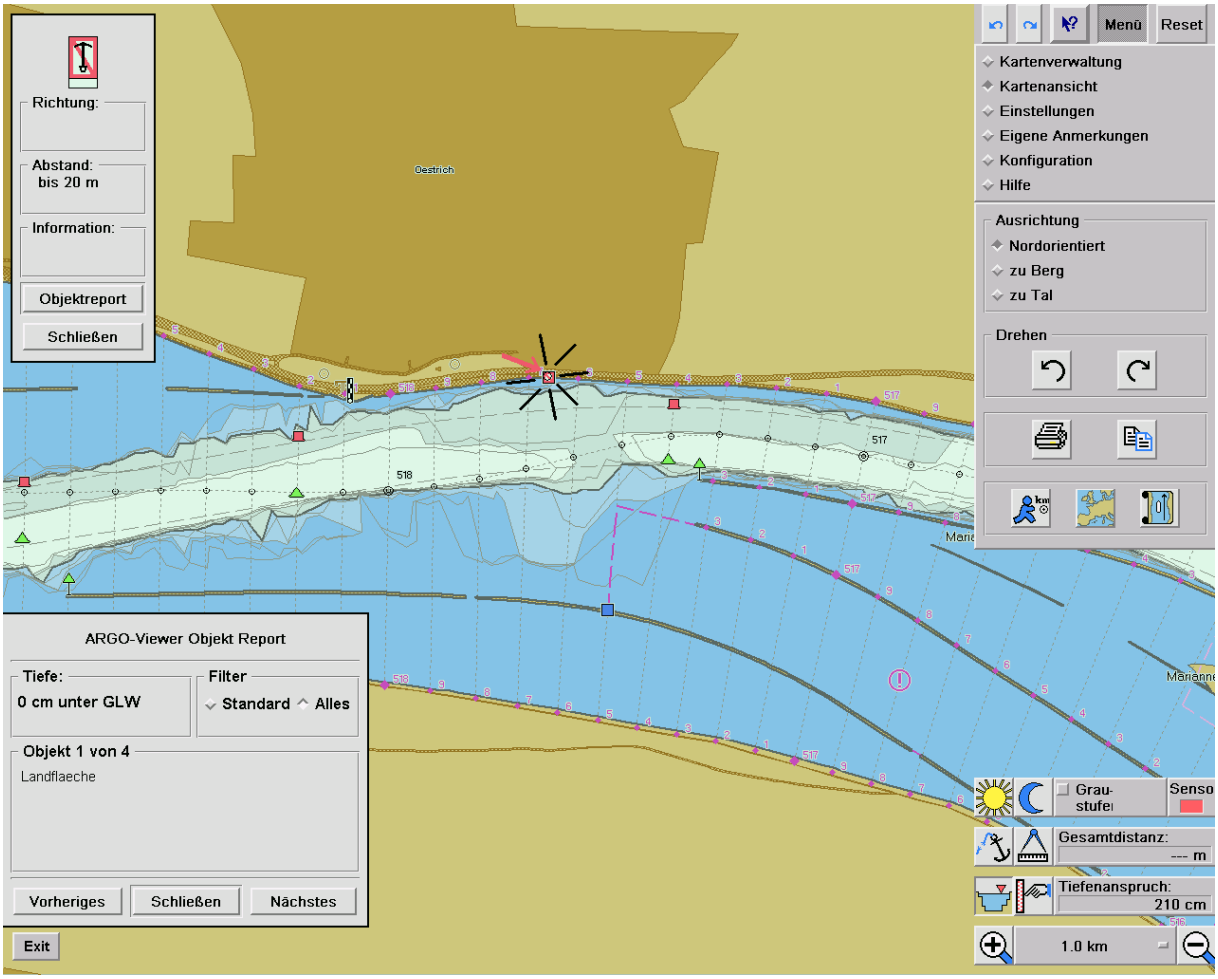
Chart production:
The Federal Waterways and Shipping Administration does provide its “electronic inland navigation charts” (Inland ENCs) free of charge.

The up-to-date list of available Inland ENCs of the German WSV with the related edition and update numbers, the compatibility with the Inland ECDIS standard, the date of release and the area of applicability is published at http://www.elwis.de/RIS-Telematikprojekte/Inland-ENC-der-WSV/index.html. This list is updated regularly.

The publication of new or revised Inland ENCs is announced in the “Amtlichen Schifffahrtsnachrichten” (official shipping communications) and in ELWIS.

Short-term changes to the state of waterways that are critical to shipping (e.g. removal of buoys or lock closures) are announced immediately as is currently done by Nautischer Informationsfunk (nautical information VHF radio service). Medium-term changes are announced via the Internet (www.elwis.de) in the notices to skippers. Long-term changes are included in the new editions of the Inland ENCs, which are planned once a year.

The official Inland ENCs of the WSV can be downloaded at www.elwis.de free of charge. Users can inform themselves about the edition of new and changed Inland ENCs via the ELWIS subscription service. The Inland ENC is provided river by river as zip file in the official S57 exchange format. The use of the Inland ENC is only possible with a suitable Inland ECDIS application (e.g. Inland ECDIS viewer). The Inland ENC is compatible with Inland ECDIS Standard 1.02, 2.0 and 2.1. The Inland ENC is checked by the WSV chart offices on compliance with the Inland ECDIS data model and completeness with regard to content. The Inland ENC is suitable for Inland ECDIS navigation mode.



Depth information in the ENC (Rhine near Oestrich)

Depths information is provided in the Inland ENC for selected bottleneck sections. The publication of depths information does not change the type and scope of traffic safety measures as currently performed by the WSV. This means that a certain fairway width (target width) and fairway depth (target depth) within the framework of what is possible and reasonable will be maintained and regularly checked by the WSV.

The depths information contained in Inland ECDIS is not part of the obligation to ensure traffic safety, but supplementary information provided by the WSV.

Shipmasters, with regard to the immersion depth of their vessels and the use of the depths information of the chart, must take into account the fact that the depths information of the chart was sounded at a certain date (snapshot) and that the riverbed constantly changes by nature.

Vessels using the depths information as a nautical tool do not have priority over other traffic.

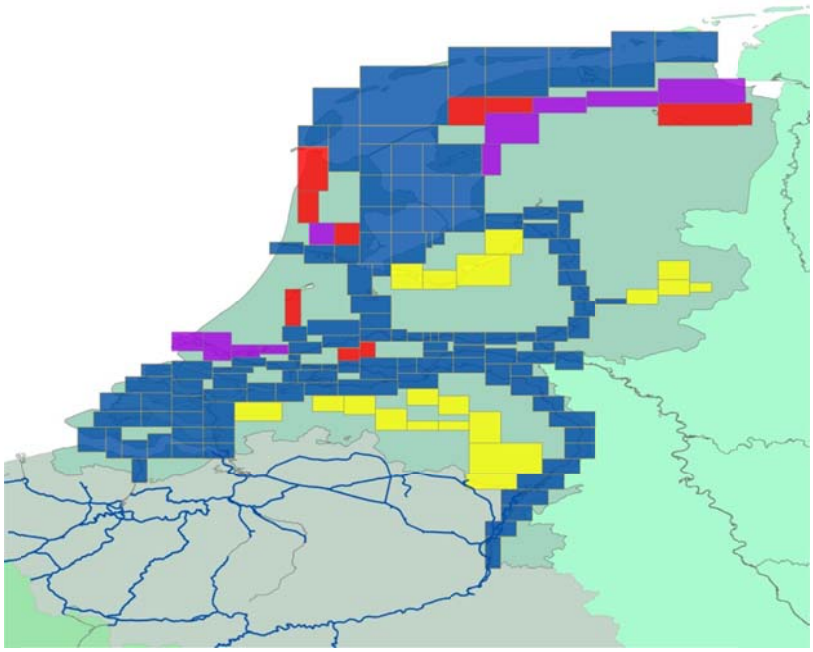
9.8 Hungary

Inland ENCs for the Danube have already been produced, the publication is under preparation.

9.9 The Netherlands

Static and dynamic information about the Netherlands fairways will be available at a central point, the RIS server (www.risserver.nl). It contains up-to-date information such as water related messages, fairway and traffic related messages, ice messages, weather forecast and Inland ENCs. This information can be retrieved via fairway, route, corridor or country. At the end of 2011 a new FIS portal will replace the RIS server. For a free ftp account send an email to waterkamer@rws.nl, the Water Chamber, part of Ministry of Infrastructure and the Environment, Rijkswaterstaat.

The coverage of Inland ENC's in the Netherlands is shown in the following map.



The legend shows the status of production and publication.

Blue: Inland ENCs of waterways of CEMT class Va/b and higher, administrated by Rijkswaterstaat are published.

Yellow: Inland ENCs of waterways of CEMT class IV, administrated by Rijkswaterstaat are published on RISserver. Decision making on production and publication of these Inland ENC is expected in 2012.

Purple: Inland ENCs of waterways of CEMT class Va/b and higher, administrated by others than Rijkswaterstaat.

Red: Inland ENCs of waterways of CEMT class IV, administrated by others than Rijkswaterstaat.

At the moment, for both (Purple and Red) coverages Inland ENCs are published as demo data via the RIS server. The new FIS-portal will not publish these "tryout (out of date)" Inland ENCs anymore. As soon as the production and publication of these ENCs is organised, publishing by the FIS-portal will start (expected in 2013).

Additional information on the Westerschelde are provided in section 9.2 of this leaflet.

9.10 Romania

Inland ENCs for the Maritime Danube from Sulina to Braila are available free of charge at www.afdj.ro.

The Corabia Port sector, km 625 – km 635, is a very difficult navigation point due to the presence of the Baloiu Island and the large width of the Danube bed in this area. This fact determines low current velocities, massive alluvium deposits and formation of submerged sandbanks. For this reason, this area is permanently monitored and the electronic maps that are drawn up provide updated data of the fairway and signal's position to the end-users (navigators) in real time. Geodesic surveys have been performed to draw up the electronic navigational chart of Corabia Port area, determining the morphology of the area (bank's alignment, limits and depths in the fairway points), the location and positioning of the floating and coastal signals and assessing the port surface. Depth values have been calculated in relation with the "0" datum of Corabia Port definition chart (level). In order to establish the outline of the banks and the island, a radar image capture system and a GPS system have been used. These lines have been adjusted by using the coordinates of the points determined on site.

For the remaining part of the sector, cells are made together with Bulgaria and Serbia. These cells contain the basic information, like fairway, coastal and floating signals, important ports, and other. These cells are produced according to edition 1.01 of the standard. Conversion of the data to the current edition of the standard is in preparation.

9.11 Serbia

Basic Inland ENCs for the Danube and the Tisza are available free of charge at www.plovput.co.yu. Extended Inland ENCs are distributed by Periskal cvba, Wuustwezel, Belgium, www.periskal.com. Conversion of the data to the current edition of the standard is in preparation.

9.12 Slovakia

Inland ENCs for the Danube are available at http://www.svp.sk/dunaj/default.asp?id=45&mnu=45 .

9.13 Switzerland

The official chart is available and can be downloaded from www.portof.ch free of charge. The chart covers the Rhine from the national border (km 170.00) up to the road bridge Rheinfelden (end of commercial shipping route, km 149.10).The presentation of the fairway refers to the equivalent water level "Gleichwertiger Wasserstand" GlW 02 - 2.65 m. (GlW 02 equals gauge Basel-Rheinhalle 5.00 m).

9.14 United States of America

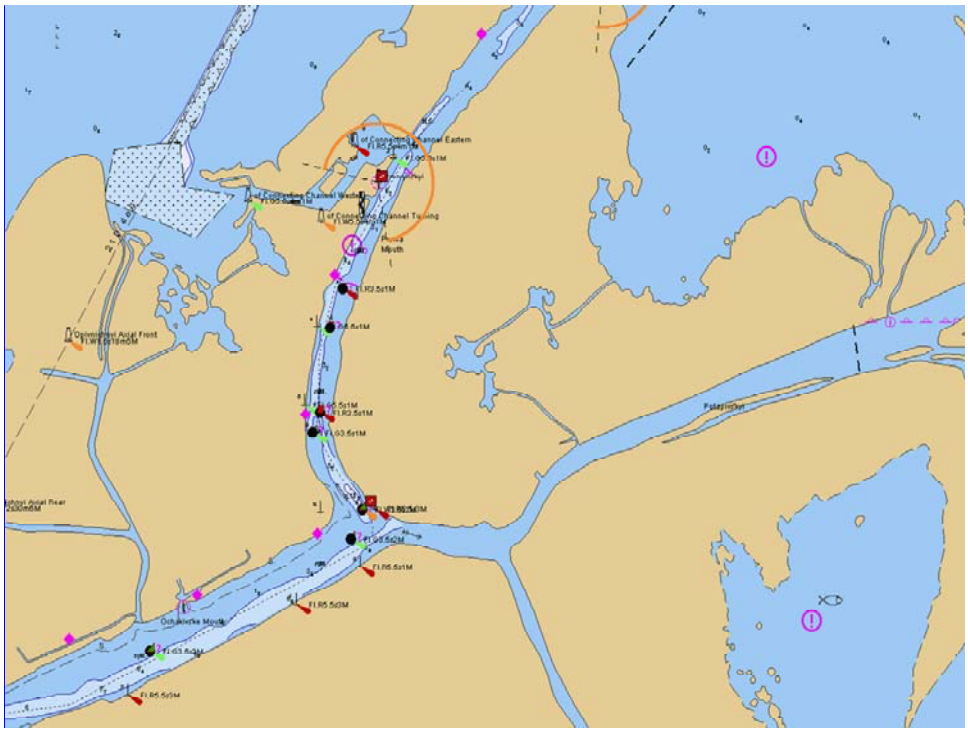
Inland ENCs for inland waterways are available free of charge at http://www.tec.army.mil/echarts/

9.15 Ukraine

Inland ENCs for the Ukrainian section of the Danube and Dnipro rivers are published by the State Hydrography Service of Ukraine (SHS). Information regarding Inland ENCs for the Danube and Dnipro rivers are available at the SHS homepage http://www.charts.gov.ua or http://www.hydrography.com.ua. SHS published Inland ENCs are appropriate for navigation. ENC distribution: Periskal cvba Wuustwezel, Jepessen Italy and Navionics.

Depths information are based on RNW 96 (low water level according to the recommendations of the Danube Commission).

Conversion of the data from edition 1.02 to the edition 2.1 of the standard is still under preparation.



Annex

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