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"NETWORK OF DANUBE WATERWAY ADMINISTRATIONS"

South-East European Transnational Cooperation Programme

STATUS QUO REPORT ON ENC ACTIVITIES

HU - VITUKI

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1 LIST OF ABBREVIATIONS

ABBR.	Abbreviation
ECDIS	Electronic Chart Display and Information System
ENC	Electronic Navigational Chart
IENC	Inland Electronic Navigational Chart
IHO	International Hydrographic Organization
S-57	IHO Transfer Standard for Digital Hydrographic Data
S-58	IHO Recommended ENC Validation Checks
ISRS	Standard for Electronic Ship Reporting in Inland Navigation
GIS	Geographic Information System
CAD	Computer Aided Design (Software)

2 SCOPE OF DOCUMENT

Activity 5.2 is related to the harmonisation of activities in the field of Inland ENC production and distribution. According to description of work SWP 5.2 (Task 5.2.3) every partner shall identify and describe the status quo on ENC activities and what are the problems. The status quo shall at least contain relevant information about:

- IENC coverage of the national stretch (incl. reasons and solution if this is not achieved so far)
- Availability of depth information within the Inland ENCs
- The IENC production process from raw GIS data into IENC objects, involved persons or organisations, used equipment and software tools
- IENC publication process (distribution of updates and new releases)
- Sources (data basis) and accuracy for IENC charts
- Create and maintain IENCs according to the Inland ECDIS Standard
- Co-operations
- Updates, updating circle

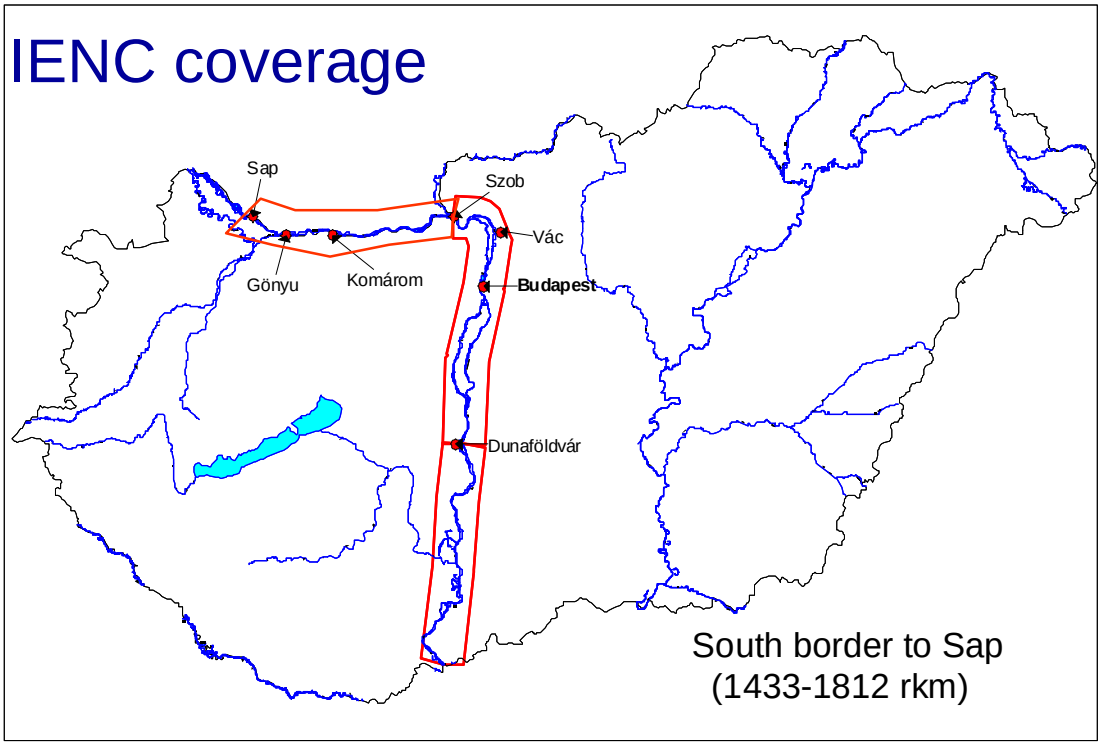
3 IENC COVERAGE

VITUKI is the producer of IENCs in Hungary.

In Hungary national Inland Electronic Navigational Charts (IENCs) are provided for the river Danube. The total length of the Hungarian Danube open for navigation is 377.9 river kilometres (1811.2 rkm – 1433.3 rkm). The charts are produced in Inland ECDIS Standard, Edition 1.02.

In Hungary all objects included in an Inland ENC are regarding the Minimum Contents of Inland ECDIS Standard, Edition 1.02:

- Bank of waterway/river bank
- Shoreline construction (e.g. dam, groin)
- Contours of locks and dams
- (Boundaries of the navigation channel/fairway (if defined), In Hungary not defined, so this component is not part of the Hungarian IENCs.
- Isolated dangers in the fairway below and above the water level, such as bridges, overhead cables and obstructions
- Shipping police regulations (e.g. buoys, beacons, lights, notice marks)
- Waterway axis with kilometres indications



The coverage of the Hungarian Inland ENC is from river km 1811.2 – 1433.3. The common border section between Hungary and Slovakia (1811.2 rkm – 1708.2 rkm, in total 103 km) is developed and provided only in Hungary for the time being. The South border of the Danube between Hungary, Croatia and Serbia is crossing the Danube so we have practically no (0 km) common border section between these countries.

To prevent the gap in IENCs Each Country prepared own chart with about 500 m overlap with other countries. The overlapping area is checked, and they fit to each other.
VITUKI prepared preliminary charts about the navigable branches of the Danube named “Szentendrei-Duna” (length 32 km) and “Ráckevei-(Soroksári)-Duna” shortly RSD (length 58 km).

The classification of the Hungarian Danube stretch is VI/B between rkm1812-1641 and VI/C between rkm 1641-1433.
The Hungarian Danube section has a full IENC coverage without any gaps.
The Inland ENCs are available and can be downloaded free of charge from the publisher (VITUKI) site or from the Hungarian RIS server. The links are the following:
http://www.vituki.hu/index.php?option=com_remository&Itemid=89&func=startdown&id=44
Or
http://www.pannonris.hu/modules/ecdis/letoltes.php?lang=en
All charts are published, the branch charts only for test purposes for the district environment and water directorates.

4 COVERAGE OF DEPTH INFORMATION

T Depths values are based on RNW 2004 (low water level according to the recommendations of the Danube Commissions).
The electronic navigations charts (ENC) contain depth data of the Danube stretch rkm 1811 - 1433, on the basis of the surveys made between 2005 and 2007, and have been edited by „VITUKI” Environmental Protection and Water Management Research Institute Nonprofit Ltd (Budapest). Owing to the flood events, water engineering work, dredging carried out in the meantime we do not assume any responsibility for the correctness of the information, for errors or incompleteness of the charts, nor for direct or indirect damage resulting from the use of these electronic navigation charts.
Depth data are intended for information purposes only.
In Hungary the whole section (1811.2 – 1433.3 rkm) is covered with depth information. In total 377.9 km are covered with depth data.

5 IENC PRODUCTION PROCESS

For the IENC end production VITUKI uses SevenCs software ENC tools ENC Manager, ENC Designer, ENC Optimizer, and ENC Analyzer. For the preparing the charts from base data we using lot of additional CAD and GIS software products, for example ESRI Arc GIS, Autodesk Civil 3D, Bentley Microstation, MapInfo Professional. The final checking of IENCs, based on IHO standard S-58, was done with the help of via-donau with ENC Analyzer.

5.1. The used software versions

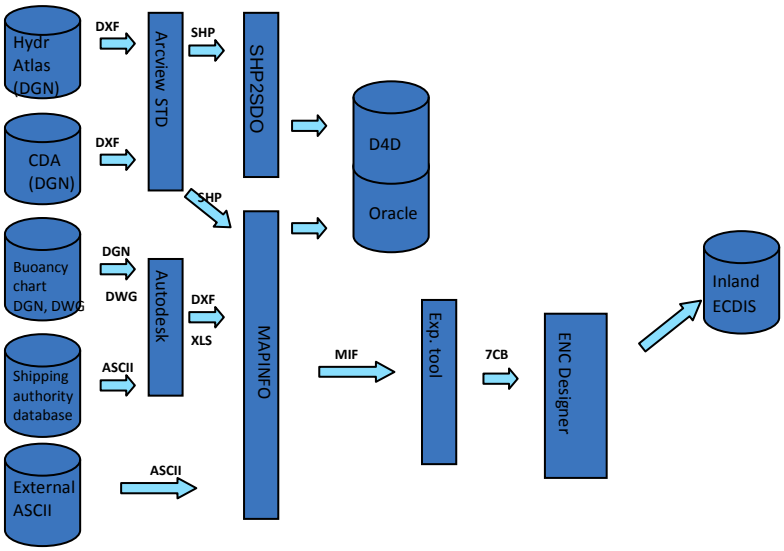
ENC Designer 4.4.0, ENC Manager 2.3.0, ENC Optimizer 2.3.0, DXF Converter 3.5.14

ENC Analyzer 2.7.0.19 (via-donau)

5.2. Hungarian Chart Producer

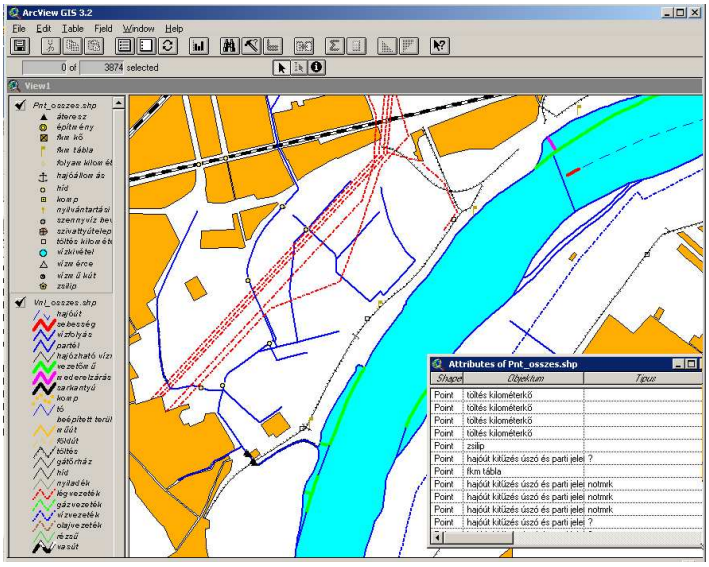
The VITUKI is the chart producer in Hungary but we cooperate with a few external companies – MicroMap Bt. -> ArcGIS, TÉR-TEAM -> Autodesk Civil 3D, MapInfo, Oracle, ENC Tools and web portal, Consulens M -> ENC Tools. Navigation information and information about harbours we obtain from District Environment and Water Directorates (ÉDUKÖVIZIG, KDVKÖVIZIG, and ADUKÖVIZIG) and State Navigation Administration (NKH).

5.3. The internal processing of the IENC

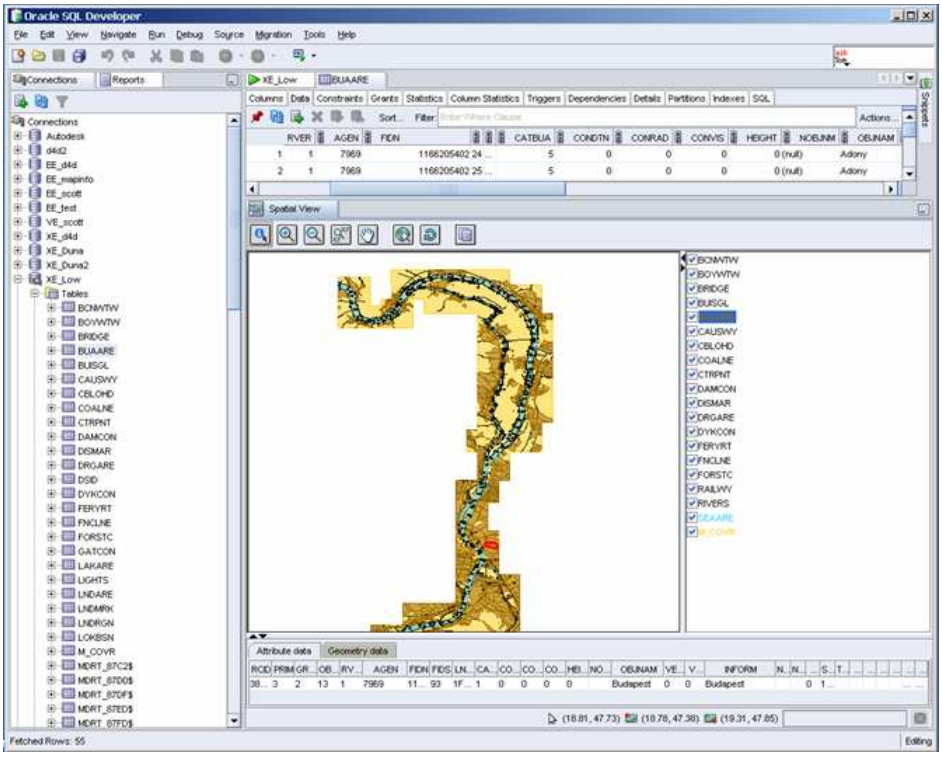


The hydro topographic bases of the ENCs are the so called Hydrographical Atlases.(Hydr. Atlas). They have detailed water related topography but no shipping information. The original format is Microstation DGN created by VITUKI. The Commission Danube Atlases named “Carte Pilotage” (CDA) created by VITUKI and the format is DGN.

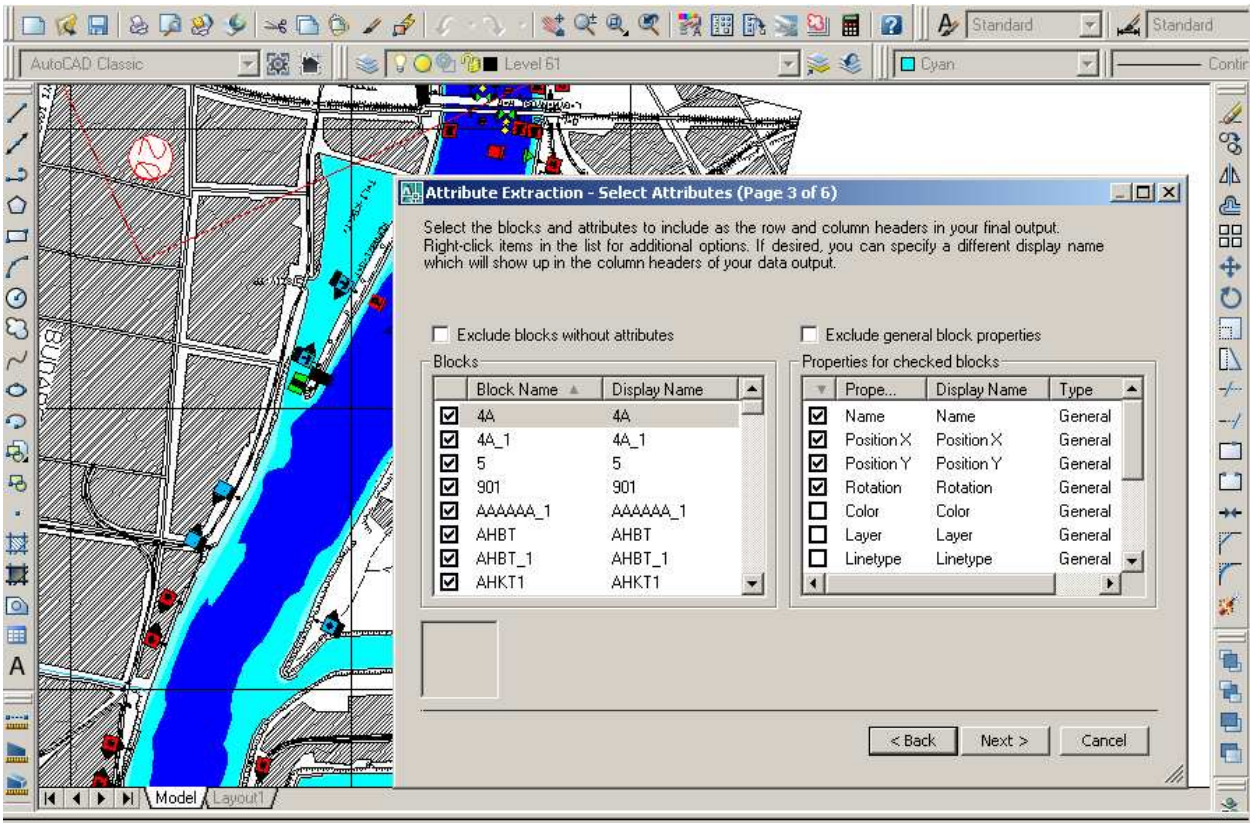
From these two digital cartographic materials we created a homogenised GIS hydro topographic database in ArcView SHP format.



From the CDA charts we import only small amount of data because the shipping related information are mostly outdated, so we cannot use them for recent charting. This SHP tables after coordinate system conversion can be uploaded into Oracle database with the Oracle supported SHP2SDO software.



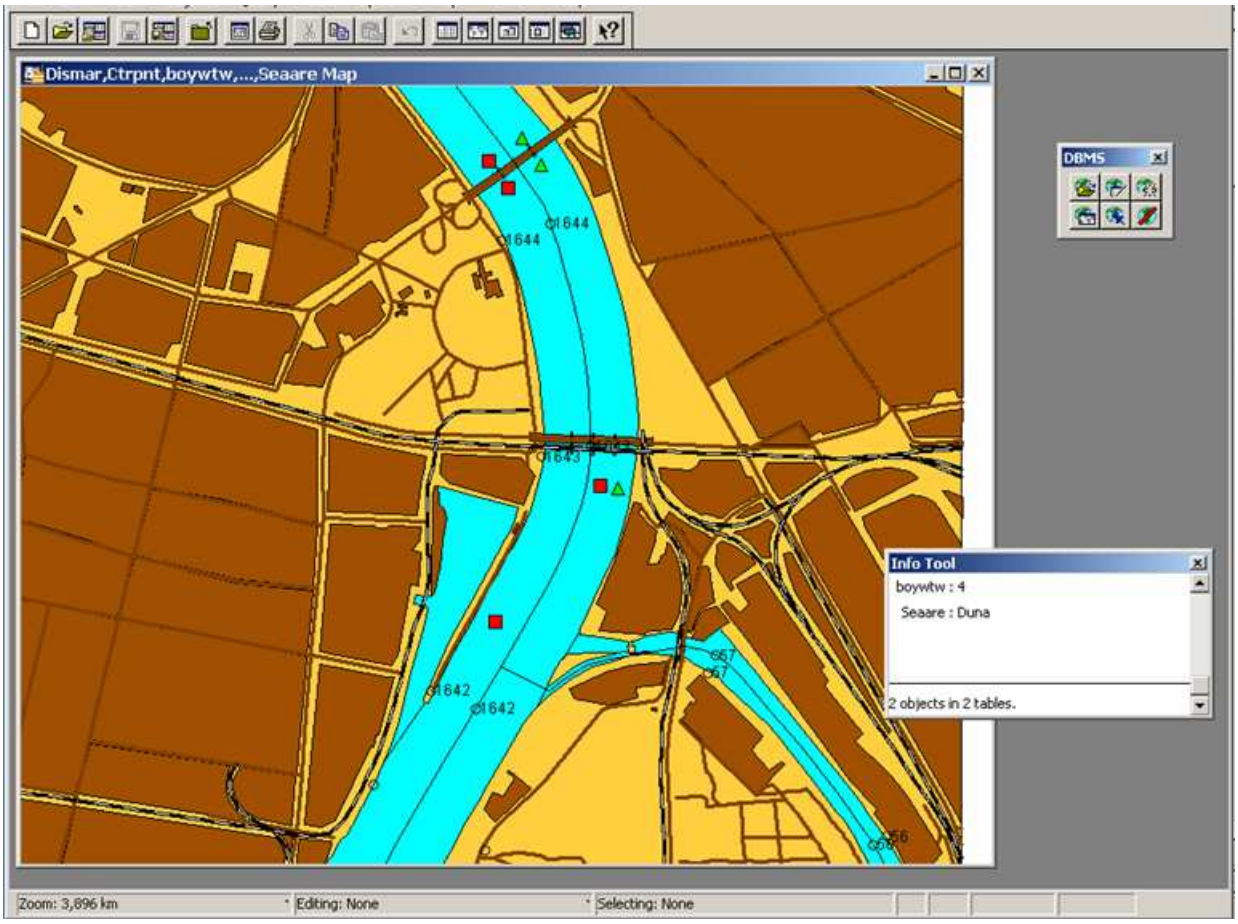
The most recent shipping related information was collected from the so called buoyancy charts that are updated yearly by the district waterway directorate. The Hungarian Danube area has 3 district waterway directorates. (North, Middle and Low Danube Valley Directorate) They use the buoyancy charts for their internal operative work. Two directorates are using Microstation, and one Autodesk Civil 3D for the maintaining the charts. We are collecting from this source the most shipping related data (notice marks, buoys, beacons etc.) and additional data from shoreline objects. The point and symbol like objects are exported with the AutoCAD "attext" function to XLS, the other objects exported as DXF.



From the Shipping Authority we received shipping rules and legal conditions mostly in text format.

We are using a lot of other source, for example for geodetic and hydrographic benchmark s gauges data. They are mostly textual data.

All above data are merged and homogenised in a MapInfo table as a national database.



In MapInfo, using conversion tables we translated the data from national data structure to Inland ECDIS object and attribute structure and exporting to MapInfo MIF file.

These structured files were converted with a special tool to SevenCs SENC File (*.7CB) format.

With SevenCs ENC tools (ENC Designer, Optimizer, Manager) we finalised the charts and we created a chart package based on IHO S-57 standard.

5.4. Available chart information in addition to the minimum content

5.4.1. Topographic information

Our charts have a very detailed basic topography for example roads, paths, rivers, build-up areas, that are useful for the shipping. We extend the charts with other visual conspicuous objects for example churches, towers, shoreline objects etc. that have importance for the visual navigation.

5.4.2. Depth information

We inserted depth data in the whole chart covered area. The contour line levels (and depth areas) are the following 0-2.5-2.7-2.9 m. All depth data are referred to RNW2004 water level.

5.4.3. Information for voyage planning (Notice marks)

All notice marks are code into IENC cells. We extend the charts with restriction area objects, for example prohibited anchoring, bridge area. And we put additional information about the horizontal and vertical clearance of the bridges in picture form into ENC packet.

5.5. Responsibility for topographical and depth information (geographical data)

Until now the responsibility is not cleared even concerning the topographical and depth information. VITUKI do not assume any responsibility for the correctness of the information, for errors or incompleteness of the charts, nor for direct or indirect damage resulting from the use of these electronic navigation charts.

5.6. Responsibility for information for voyage planning (Notice marks)

We received this information from the district environment and water directorates and from the national shipping authority but we checked only of small amount of such a data so the responsibility is not clear.

5.7. Using the layering method in data providing

We area not using layering at the moment, each cell contains all data what is relevant for the cell covered area.

6 IENC PUBLICATION PROCESS

6.1. Publication details

The charts are published as a chart packet.

In Hungary Inland Electronic Navigational Charts (Inland ENCs) are published in S-57 format by VITUKI conforming the Inland ECDIS Standard Edition 1.02

The Hungarian charts are available for free.

The Hungarian Inland ENCs can be downloaded free of charge from the publisher (VITUKI) site or from the Hungarian RIS server. The links are the following: http://www.vituki.hu/index.php?option=com_remository&Itemid=89&func=startdown&id=44

Or

http://www.pannonris.hu/modules/ecdis/letoltes.php?lang=en

6.2. Problems in the publication of IENCs

The main problem is the mostly outdated basic data. We need to define clearly the responsibility of the base data components.

7 IENC SOURCES AND ACCURACY

7.1. The sources for the IENCs

We described the sources and the short process in point 5.

The most important sources are:

- Hydrographical Atlas (Database) - VITUKI
- Buoyancy charts – District Environment and Water Directorates
- Additional shipping related data - Shipping Authorities

7.2. Plans for the future

We need to build a new water related GIS database with connecting to the Shipping authority database, to better maintenance, clarified responsibility of each component.

The accuracy the base topographical data is conforming to charting standards to the relevant compilation scale.

We have two main problems:

- The base data are outdated
- The position of notice marks are only reported not measured.

The accuracy of the depth data is quite high, about 10 cm. We are using for the depth surveying in 3D geodetic total station followed special measuring ship equipped with monobeam hydro acoustic device (echo sounder). The problem is not with the accuracy but with the seamless coverage of the most important areas. We have a multibeam survey system but we are just starting the measuring of the relevant sections with this method, so we need time until publishing the guaranteed depth data.

8 INLAND ECDIS STANDARD

Currently we are producing the IENCs conform with Inland ECDIS standard version 1.02

We need additional tools to convert data to Inland ECDIS Standard, Edition 2.0 or next formats.

IENC quality control checks at the end of the production process.

We checked the end material with 3 different ways:

- ENC Designer internal checking based on the import log

- ENC Analyzer. This checking was done by via-donau.
- External checkers, viewers (Not SevenCs products)

We correct all relevant errors based on checking log of checking software. Some errors are irrelevant because the analyser software configuration was not fine tuned for this type of charts.

9 UTILISATION OF LOCATION CODES AND RIS INDEX

At this moment only very few objects have the ISRS Location code.

At the moment only the gauges objects have ISRS information coded into NOBJNM attribute.

At present the responsibilities in Hungary are not defined for the provision of the Minimum Data (i.e. also the RIS Index) as prescribed in the Annex I of the RIS Directive 2005/44/EC.

For which fairways is the RIS Index provided?

The RIS Index will be provided First time to the Danube rkm 1499-1812, later all navigable waterway category higher as V.

We need to develop the workflow in order to keep the synchrony with the IENCs and the tabular data.

We have no tools or software module used to extract the ISRS Location Codes from the IENC objects to the RIS Index.

10 COOPERATIONS

We have 103 km long common border section with Slovakia. We have a basic cooperation with Slovakia. Based on a bilateral agreement we provided the depth data to SVP and they should have given us the aerial photogrammetric data. We sent the depth data, but we have not received any data from the Slovak partner.

The South border of the Danube between Hungary, Croatia and Serbia is crossing the Danube so we have practically no (0 km) common border section between these countries. We checked the border lines with Croatian and Serbian chart producers.

We have no agreement concerning ‘area of responsibility’.

11 CHART UPDATES, UPDATING CIRCLE

We are just starting the publication so we have not enough information about the updates. Theoretically when there are only a small amount of changes in the cells, we are using updates. More changes need a new edition.

We have official feedbacks only from the buoyancy service, and from the shipping authority.

We receive these feedbacks from the waterway directorate (buoyancy service) in so called mariners overlay digital format coming out from the on board ECDIS application. (Innovative Navigation Radarpilot 720)

The shipping authority gives us a written report and opinion.

- End of document -