

Baltic Sea Hydrographic Commission

Liikennevirasto
Finnish Transport Agency

BSHC proposed articles to IHR

16-18 September 2013
Tallinn, Estonia

Juha Korhonen

18 September 2013

Needs for publicity

In several cases the work and co-operation within the Baltic Sea Hydrographic Commission and harmonisation actions within the Baltic Sea have been recognized to be very fruitful and successful.

There have been proposals to forward information on these co-operation to wider audience, e.g. BSHC 17th Conference in September 2012 recommended to submit an article to IHR on Baltic Sea re-survey Scheme and the NHC 57th Conference in April 2013 recommended an article on experiences of contracting hydrographic survey operations.

There are frequent requests from e.g. HELCOM to have written descriptions on BSHC co-operation activities.

Printed copies of this edition could be used as an information paper for various purposes, e.g. as an information paper on international meetings around Baltic Sea (e.g. HOs, HELCOM, EU BSAP meetings). Additional copies of this IHR issue could perhaps be tabled at the forthcoming IHO 5EIH in October 2014.

Possible topics

- **Baltic Sea Re-survey Scheme**
- **MonaLisa project**
- **Baltic Sea Depth Model**
- **Wider use of hydrographic data**
- **Experiences of contracting out hydrographic survey operations**
- **Lidar Bathymetry test projects on Baltic Sea**
- **Other BSHC harmonization actions**
- **Other possible Notes**

Examples

SUCCESS STORIES

RE-SURVEYING OF SHIPPING ROUTES AND PORTS

One of the Flagship Projects of this priority area concerns the re-surveying of shipping routes and ports in the Baltic Sea region. Electronic charts (ECDIS) will be soon a mandatory navigation tool. However, no matter how precisely a position is indicated by GPS, the information is not useful without reliable and exact charts. Also the increasing size and speed of ships set new requirements to the chart information. For exceptional cases (e.g. ice condition or accidents) and environmental protection there are needs for accurate depth information also outside routes. As many of today's nautical charts are based on somewhat inaccurate surveys up to 100 years old, there is a need for re-surveying with modern technology.

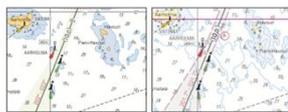
In the early 2000's it was clearly recognised that the status of hydrographic surveys on the Baltic Sea is not satisfactory. In 2001 the Baltic Marine Environment Protection Commission (Helsinki Declaration) agreed at ministerial level to request the Baltic Sea countries to develop a scheme for systematic re-surveying of major shipping routes and ports in order "to ensure that safety of navigation is not endangered by inadequate source information". In 2002 the Baltic Sea Hydrographic Commission (BSHC) of the International Hydrographic Organisation approved the first version of Harmonised Hydrographic Re-Survey. The HELCOM 2010 Ministerial Declaration agreed to extend the re-survey scheme to cover the whole Baltic Sea area and requested the Baltic Sea countries to present their national re-survey plans by 2011 including time schedule estimations and sufficient funding for re-surveys of areas used for shipping.

The efforts to speed up these re-surveys obtained the label of Flagship Project in the ESPSR in order to underline the importance of the work, and has helped to increase the commitment of all Baltic Sea countries and raise the awareness of the re-surveys.

All Baltic Sea countries are now committed to this re-survey scheme. There is a clear goal to complete re-surveys of areas used for shipping by 2016. Hydrographic surveys are a long term activity and are mostly funded by national budgets. External EU TEN-T funding is used by Finland and Sweden during 2011-2013 in the MONALISA project. These re-surveys have been carried out by private companies and they have speeded up the completion of extensive areas on the Gulf of Finland. The BSHC has recommended its members to apply for external funding from EU TEN-T in the financial perspective 2014-2020.

The re-surveys have already proved most useful: new shallow or shallower areas previously unknown have been found on critical areas. The efficiency of re-survey work has increased by systematic planning and by close co-operation within neighbouring countries. In some cases the neighbouring countries have agreed to allow re-surveys on the other's areas of responsibility in order to increase efficiency. Some Traffic Separation Schemes have been modified based on the new information from re-surveys. This work has good political support within the Baltic Sea countries and it has been recognised as a good example of regional cooperation within hydrography.

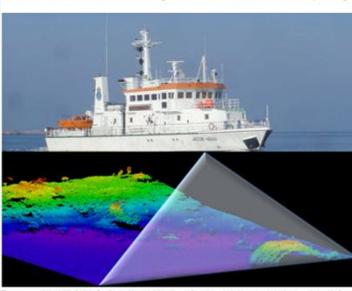
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SUCCESS STORIES

Maritime goes digital

Two Flagship Projects of the Priority Area on Maritime Safety and Security – MONALISA and Speed up re-surveying of major shipping routes and ports – use modern technology to ensure reliable information for safe navigation at sea and more efficient route planning.



The survey vessel 'Jacob Högl', of the Swedish Maritime Administration, explores the seabed with modern technology to optimise shipping routes.

MONALISA is a Motorways of the Sea project which aims at making a tangible contribution to efficient, safe and environmentally friendly maritime transport. The project obtained Flagship Project status in the ESPSR in 2012.

The aim of the MONALISA project is to speed up hydrographic re-surveys for the major navigational areas in Swedish and Finnish waters in the Baltic Sea, develop a functional system for exchange of maritime data, demonstrate a new model for route planning and concept model automatic verification system.

The European Commission has highlighted the importance of creating safer navigation routes and the MONALISA project, led by the Swedish Maritime Administration and including partners in Denmark and Finland, is a regional response to this.

One part of the MONALISA project is to develop, test and demonstrate a new concept of dynamic and proactive route planning. The concept is designed to provide shipping operators with information that enables to operate their business in the safest, environmentally friendliest and most efficient manner possible. The route plans are also exchanged to other vessels and to traffic control centers.

"The project has attracted a considerable international interest, which confirms that we are on the right track", said Magnus Sundström, Project Manager for MONALISA.

The MONALISA project is co-financed by the Trans-European Transport Network (TEN-T) and will run until 2013. More information can be found at www.monalisa-project.eu

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Examples

Finnish Maritime Administration
Hydrographic Department
Juha Korhonen
3 December 2008

DRAFT - V.2

Regional cooperation within Hydrographic Offices to enhance safety of navigation

Case: ENC harmonisation on the Baltic Sea

The Baltic Sea Hydrographic Commission (BSHC) recognized the need for ENC harmonisation in June 2007 and established an ENC Harmonisation Working Group to review inconsistencies between Baltic Sea ENCs and to propose actions to resolve them. The work ended up to 17 recommendations to improve the ENC consistency on the Baltic Sea. Most of the recommendations are aimed to the ENC producers. In August 2008, the BSHC approved the report and its recommendations. It also agreed on a realistic implementation schedule for most of them and decided to monitor the implementation.

The IHO WEND and CHRIS committees in their recent meetings recognized regional implementation of the IHO recommendations to be feasible to increase the safety of navigation and recommended to promote this kind of cooperation to all Regional Hydrographic Commissions.

Background/Current situation on Baltic Sea ENCs

Baltic Sea ENC coverage is already fairly good, see Fig.1. So it is now time for the HOs to concentrate on improving the quality and consistency of their ENCs.



Fig.1. Baltic Sea ENC coverage on August, 2008.

The IHO Baltic Sea Hydrographic Commission established a Working Group to study ENC harmonisation on the Baltic Sea. The Working Group studied the existing ENCs and identified a large number of inconsistencies between the Baltic Sea ENCs. Most of the inconsistencies can be seen visually on ECDIS screen at border areas between countries. Some example cases are shown in Fig.2.

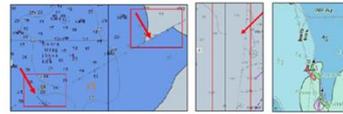


Fig.2. Examples of found inconsistencies. **[Red in original]**

The Working Group made two questionnaires: one for the Baltic Sea Hydrographic Offices and the second for mariners using Baltic Sea ENCs in their ECDIS.

Most of the inconsistencies are in General, Coastal and Approach usage bands. There is only one Overview call in the Baltic Sea. Harbour and Berthing cells are mainly disjoint so no inconsistencies can be seen between them.

The Working Group evaluated the found inconsistencies, identified reasons for them and made proposals to avoid them. The Working Group studied mainly the following issues:

- Use of Compilation scale and Usage bands
- Use of Scale minimum (SCALEMIN)
- Use of Depth contours (DEPCNT) and Depth areas (DEPAR)
- "Across Borders" to cover all features in the border areas
- Testing for harmonisation before launching ENC
- Use of up to 5 metres buffer zone to eliminate gaps

Priorities for these harmonisation issues were set by the expected mariners' point of view.

Clear need for harmonisation

Mariners' point of view most of these inconsistencies are not safety critical. Inconsistent ENC displays on ECDIS may need additional attentions to mariners and thus cause extra work. Inconsistencies may also decrease mariners trust to the ENCs and the use of ECDIS. **[Red in original]**

There are also many international regulations and recommendations require harmonization, e.g.:

- SOLAS V Regulation 9 requests Member states to "co-operate", "coordinate activities" and "pursue possible uniformity".

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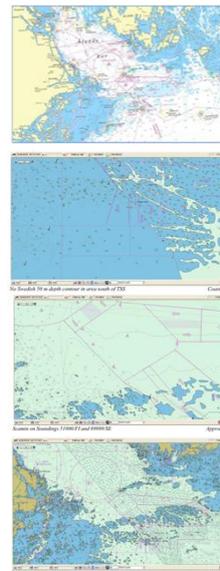
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Examples

Fig.4. Example of a Nautical Chart before and after re-surveys. After re-surveys more detailed depth contours can be seen on the chart and a critical shallow 9.7 m found very near to a railway of 10.0 m draft.

Fig.6. Examples of Baltic Sea Depth Model of the Botnian Sea with varying density of survey data. The resolution in the overall dataset from the Baltic Sea Bathymetric Database is 500 m, but in re-surveyed areas it could be 25 m or more dense. The rectangle area on the right demonstrates how detailed the sea floor features (e.g. drummines) can be seen with a 4 m grid.



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Exa

International Hydrographic Organisation (IHO)
Hydrographic Co-operation within the Baltic Sea Hydrographic Commission (BSHC)



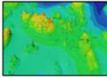
Harmonised Re-survey Scheme
(according to HELCOM 2010 Moscow Declaration; CAT I and II for safety of navigation, CAT III for other purposes)



Harmonisation of Baltic Sea ENCs
(eliminating discontinuities and variations on border areas)



Coordination of Baltic Sea INT Charts
(maintaining charting schemes, chart numbering, printing schedules)



Harmonisation of presentation and distribution of Baltic Sea depth information
(for high resolution depth data and harmonised data sets, depth models). Also MonaLisa subactivity 3.2.



Harmonisation of Baltic Sea vertical references.
Also MonaLisa subactivity 3.3.

57th NHC Meeting
 15 – 17 April 2013, Arkö Island
 Contracting Surveying Sweden

Experiences on Contracting Surveys in Sweden

Background
 The Swedish Maritime Administration has since 2007 combined hydrographic surveying with own resources and contracting external companies. All procured areas have been in the EEZ except for a small part in the territorial sea. During the period 2011 – 2013 the amount of survey areas in Swedish waters have been extended due to extra funding from the EU TEN-T program where both Sweden and Finland have been involved in the MONALISA project. Within this project an area in Swedish waters of approximately 19 000km², with depths mostly between 20 – 150m, has been surveyed by the German company Fugro OSAE and the Swedish company Marin Mittelskiff (MMT). When compiling this paper, approximately 60 % of these areas have been surveyed. According to the contract all field work shall be finished by 30 September 2013 and all data accepted by SMA by 30 November.

Procurement procedures
 Within the MONALISA project two public procurements have been made. In 2011 there was a joint procurement between SMA and FTA (Finnish Transport Agency) and for 2012-13 we procured surveys using an almost identical specification as for 2011. The following surveys have been purchased by SMA:

- 2008 South and East of Öland: 2329 km², depths 20-100m, 10 MSEK
- 2009 Southwest of Gotland and East of Gotland: 8240 km², depths 22-200m, 20 MSEK
- 2011 Sea of Bothnia main routes: 4612 km², depths 9-210m, 1.55ME
- 2012-13 Sea of Bothnia, Bay of Bothnia and central Baltic sea: 14816 km² 4.14 ME



Fig 1 Areas surveyed, or being surveyed, by Fugro OSAE and MMT 2011 – 2013. Areas marked in red also indicate the common procurement with FTA 2011.

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Examples

Hydrographic Co-operation within HELCOM

Copenhagen 2001 Ministerial Declaration

- In order to ensure safety of navigation on main shipping routes
- Re-survey according to the latest IHO standards
- First Scheme developed by BSHC in 2002
- Re-surveys going on



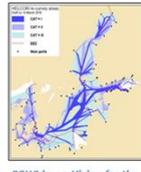
First Re-survey scheme 2002

Moscow 2010 Ministerial Declaration

- To extend the re-survey schemes for the whole Baltic Sea
- According to BSHC Vision
- CAT I and II for safety of navigation
- CAT III for other reasons
- Time schedules for CAT I and II



Shipping is using almost the whole Baltic Sea



BSHC has a Vision for the whole Baltic Sea



Status of Re-survey database Sept. 2011

Action Plan of the EU Strategy for the Baltic Sea Region (EUSBR)

Priority Area 13: *"To become a leading region in maritime safety and security"*

Flagship Project 13.3: *"Speed up re-surveying of major shipping routes and ports"*

Monalisa Project (TEN-T) – a practical joint action

Co-financed by the European Union
 Trans-European Transport Network (TEN-T)

A co-operation project to foster the implementation of the Action Plan

Four main activities. Activity 3 for hydrographic issues:

3.1 Speed up re-surveys (to speed up CAT I + II re-surveys by one year)

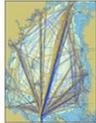
3.2 Baltic Sea Depth Model

3.3 Harmonisation of vertical references





Re-surveys are based on modern multi-beam survey systems giving full bottom coverage with high density data.



AIS tracks



Re-survey areas

MonaLisa 3.1 re-survey areas on Bothnian Sea for 2011. The re-survey areas are defined based on high density shipping routes and areas.

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Possible future actions

A feasible target date could be IHR November 2014 edition.

If the publication is already ready by the beginning of October 2014, then this edition could be tabled to the participants of the 5EIHC.

This means that at least the peer reviewed articles should be available on the first half of 2014, others by July/August 2014.

Note also the IRCC5 Actions:

IRCC5/36 RHC to provide material to promote achievements of IRCC Bodies

IRCC5/37 IHB to take every opportunity to promote achievements of IRCC Bodies

Actions requested from the BSHC18 Conference

BSHC18 Conference is requested to

- **endorse the proposal to forward articles to IHR,**
- **to propose a special Baltic Sea Edition to be considered by the Editorial Board of the IHR**
- **indicate priority of selecting the proposed topics and indicate volunteers to the authors of the topics**
- **nominate a volunteer BSHC coordinator for this issue**
- **give further guidance, as seen appropriate**

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Thank you!

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