Finnish Transport Agency
Hydrographic Office
Juha Korhonen
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PA Safe: Progress Report of the Flagship project

"Speed up re-surveying of major shipping routes and ports"

1. As reported at EUSBSR Priority Area Safe Steering Committee meeting in November 2012, the BSHC/HELCOM Revised Baltic Sea Harmonised Re-survey Scheme has been endorsed to be reported to the HELCOM Ministerial Meeting to be held on 3 October 2013.

2. The HELCOM HOD and Commission meetings in March 2013 have endorsed the reporting. The following draft text related to re-surveys has now been included in the Draft Ministerial Resolution.

   22 (M). RECALLING the Re-Survey commitments of HELCOM Ministerial meetings of 2001 (Copenhagen) and 2010 (Moscow), WELCOMING the subsequent progress made in systematic re-surveying of major shipping routes and ports in the region according to the HELCOM-BSHC Re-survey Scheme in order to ensure that safety of navigation in the Baltic Sea region is not endangered by inadequate source information, ADOPT the BSHC Harmonised Re-survey Scheme 2013 with time schedule estimations and funding arrangements bearing in mind that these are likely to be modified when new needs or priorities arise, [*Harmonised Re-survey Scheme 2013 under development within BSHC- to be submitted to MARITIME*]

   23 (M). AGREE to take actions to ensure the completion of the re-surveys for areas used by navigation (CAT I and II) within the time schedules estimated in the 2013 Re-survey Scheme; AGREE to promote wider use of accurate and reliable depth information by e.g. developing existing and/or new products including an enhanced and freely accessible Baltic Sea Depth Model; AGREE to foster CAT III re-surveys for e.g. environmental purposes or for safety of navigation of small crafts.

3. The BSHC Re-survey Monitoring Working Group (MWG) is preparing a background document highlighting the main issues of the re-survey Scheme. The Final Draft document is attached as Annex to this report. This document includes also the estimated time schedules for re-surveying areas used for navigation (CAT I and II). This Final Draft document has been forwarded to the BSHC Members for approval.

4. The resolution text and the background document will be discussed at the MARITIME 12/2013 meeting on 4 June 2013 and is expected to be endorsed to be forwarded for adoption to HELCOM Ministerial Meeting in October 2013.

5. MWG Members are updating and completing the Re-survey Database. Current status of the Re-survey Scheme can be viewed via the link: https://helcomresurvey.sjofartsverket.se/helcomresurveysite/.

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Annex: Final Draft BSHC Report to HELCOM on the Revised Baltic Sea Harmonised Hydrographic Re-survey Scheme, Draft by 26 April 2013.

Report of the IHO Baltic Sea Hydrographic Commission (BSHC)

The BSHC/HELCOM Revised Baltic Sea Harmonised Hydrographic Re-Survey Scheme

HELCOM Ministerial Meeting
3 October 2013

[Final Draft by 26 April 2013]

[Proposed to be approved by the BSHC Members and to be forwarded for adoption to the HELCOM Ministerial Meeting on 3 October 2013]

The Hydrographic Offices of Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russian Federation and Sweden have developed this Scheme during 2002 - 2013.

Executive Summary

In the early 2000s, it was clearly recognised that the status of hydrographic surveys of the Baltic Sea is not satisfactory. Precise satellite based positioning is available for all, but many of today´s nautical charts are based on surveys of up to 100 years old and with poor positional accuracy. Navigation with electronic charts is increasing and IMO has approved ECDIS to be a mandatory navigation tool within few years. The increasing size and speed of ships today set new requirements for chart information. In exceptional cases (e.g. ice conditions or accidents) as well as environmental protection, there are many needs for accurate depth information also outside the main routes. Thus there are clear needs for re-surveying the areas used for shipping with modern technology.

The HELCOM Ministerial Declarations in 2001 and 2010 requested the Baltic Sea countries jointly to develop a scheme for systematic re-surveying of the areas used by shipping in order "*to ensure that safety of navigation is not endangered by inadequate source information*". The Baltic Sea countries are to present their national re-survey plans by 2013 including time schedule estimations and plans for sufficient funding for re-surveys.

Hydrographic surveys are a long term activity. All Baltic Sea countries are committed to the Baltic Sea Harmonised Re-survey Scheme. This work is coordinated by the Baltic Sea Hydrographic Commission (BSHC) of the International Hydrographic Organisation. There is a clear goal to complete the re-surveys by 2030. The re-surveys are mainly funded by national budgets.

The re-surveys have already proved to be most useful. New shallows or areas shallower than previously known have been found in critical areas. The efficiency of the re-survey work has been increased. More examples are listed below in the Chapter *Benefits of Re-surveys*. An example of the new high density data can be seen in *Fig.1*.

Fig.1. Examples of Baltic Sea Depth Model of the Bothnian Sea with varying density of survey data. The resolution in general is 500 - 200 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. drumlins) can be seen with a 4 m grid.

Background

The HELCOM Copenhagen 2001 Ministerial Declaration requested the Governments of the Contracting Parties 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. The survey shall be carried out to a standard not inferior to the latest edition of IHO S-44*, [1], [2].

The BSHC approved the first Version of the Harmonised Hydrographic Re-Survey Plan in December 2002. These routes were based on the list of main ports used as a background document for the Copenhagen Declaration [3]. See *Fig.2*. There were no fixed time schedules for these re-surveys.

Fig. 2. Original Re-survey Scheme (based on Copenhagen 2001 Declaration)

During the past ten years it has been found that there are several reasons to revise the original scheme, e.g. new routeing measures approved and planned new high priority areas outside the original routes, AIS data allows accurate tracking of ships routes. In addition there are other needs than navigation. In 2009, the BSHC approved a new Vision for a revised re-survey scheme so to extend the original scheme to cover the whole Baltic Sea area. The re-surveys are in three Categories: CAT I for original re-survey scheme, CAT II for extension needed for the safety of navigation, and CAT III for areas to be re-surveyed for other reasons, (e.g. for environmental reasons). In the *Fig. 3* there is a scheme of this Vision.

Fig. 3. In 2009 the BSHC approved a Vision for re-surveys.

The HELCOM Moscow 2010 Ministerial Declaration agreed to extend the scope of the HELCOM Copenhagen Declaration and present time schedule estimations for re-surveys. The Moscow Declaration 2010 and its supporting documents can be found in references [4], [5] and [6].

The Moscow 2010 Declaration specifically requests the Contracting Parties to:

- *develop the Revised Baltic Sea Re-survey Scheme to cover the whole Baltic Sea according to the BSHC 2009 Vision*
- *include CAT I and II re-surveys to cover all routes and other areas used for navigation*
- *include CAT III re-surveys for other areas than for safety of navigation purposes (e.g. environmental)*
- *specify time schedule estimations for CAT I and II re-surveys*
- *present their national re-survey plans preferably by 2013, but not later than 2015*
- *undertake necessary measures to ensure that sufficient funding, including external funding, will be available for the re-surveys*
- *undertake measures to improve mariners' abilities to assess and interpret hydrographic content in nautical charts and publications either in printed or digital form, especially in the Electronic Chart Display and Information System*

In autumn 2012, The BSHC reported that the Revised Re-survey Scheme is already quite complete and proposed to report the status of its implementation to the HELCOM Ministerial Meeting on 3 October 2013. The BSHC also emphasised that hydrographic surveys provide useful information for several sectors in society.

Benefits of Re-surveys

The re-surveys have already proved useful. The overall goal for the re-surveys is to increase safety of navigation, and more specifically for the following benefits:

- The re-surveys will cover areas used by shipping where old or otherwise inadequate depth information currently exists, and will thus allow safer sea areas for shipping and increase the protection of the marine environment.
- Accurate and reliable full bottom coverage of surveys allow for more flexible route planning, more precise navigation and more flexibility to utilise the increased loading of ships, and thus increasing the economic efficiency of shipping.
- During the re-surveys, critical new shallows or shallows shallower than previously known have been found and appropriate actions have been launched.*Fig.4.*
- Well planned re-surveys enable revisions of fairways or routes, and planning of modified or new Traffic Separation Schemes. *Fig.1*.
- The efficiency of the re-survey work has increased. These activities have enhanced systematic planning and co-operation between neighbouring HOs regarding surveys along border areas and allowing surveys in each other's areas of responsibility, and thus enabled more feasible re-survey tasks and more efficient survey operations. *Fig.5.*
- Modern full coverage depth information enables changed practices in navigation with new ECDIS functionality (e.g. 3D navigation with real time dynamic water level information, precise warnings).
- It is often more feasible and productive to completely re-survey the sea areas where old survey data exists than try to use old data and estimate where it will be useful. Old dataset are in many cases inhomogeneous and partial re-surveys are inevitable. New re-surveys will give homogenous data across national borders.

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 fairway of 10.0 m draft.

Fig.5. Examples of co-operation of re-survey work between neighbouring countries (Finland/Sweden, Denmark/Germany).

Status of the Revised Baltic Sea Harmonised Re-survey Scheme

Each Baltic Sea Hydrographic Office (HO) is responsible for developing and implementing their National Re-survey Plans in its area of responsibility. The composition of the National Plans will form the Baltic Sea Harmonised Re-survey Scheme.

Sweden volunteered to develop and maintain the re-survey database and its web-based user interface. The database contains metadata of the re-survey areas and the status of their re-surveys. With the web-based database restricted interface the metadata of re-surveys can be loaded and updated in the database by each HO by the nominated National Database Operators. The Browser interface is open to all via the link: http://helcomresurvey.sjofartsverket.se/helcomresurveysite/.

The BSHC has a common understanding that even if the re-survey Plans will be approved by the BSHC and forwarded to the HELCOM, these plans are not fixed. They are likely to be modified when new needs or priorities arise.

Currently (April 2013) the total amount of re-survey areas is 386.042 km^2. The total amount of areas still to be resurveyed is 244.376 km^2. See more details in *Tables 1 - 3* and in *Fig.6 - Fig.8*. [1]

Total areas by Categories [Km^2]				
	CAT I	CATII	CAT III	Total
Denmark	7690	12019	7685	27395
Estonia	8362	20766	6999	36127
Finland	17926	23063	40481	81470
Germany	3454	11895	0	15349
Latvia	2481	5065	20684	28230
Lithuania	1585	26	4819	6430
Poland	4367	892	7582	12841
Russia	1143	8	20858	22010
Sweden	48572	68157	39462	156191
Total	95582	141891	148570	386042
%	25	36,8	38,5	100

Table 1 and Fig. 6: Re-survey areas [Km^2] in the database by Categories (by 18 April 2013).

Re-survey areas remaining by Categories [Km^2]				
	CAT I	CAT II	CAT III	Total
Denmark	759	10596	7685	19040
Estonia	3716	13873	6950	24539
Finland	1609	13193	34798	49600
Germany	171	607	0	778
Latvia	0	4186	20554	24740
Lithuania	429	0	4698	5127
Poland	2855	892	5489	9236
Russia	1130	8	0	1138
Sweden	16039	54717	39422	110178
Total	26708	98072	119596	244376
%	11	40,1	48,9	100

Table 2 and Fig. 7: Re-survey areas remaining (by 18 April 2013)

The HOs have various time schedules to complete the re-surveys, see *Table 3*. Possible means to enhance and foster the implementation of the re-surveys should be studied. These could be the possibilities to utilize the capacity more effectively, possibilities to get extra funding for speeding up the re-surveys, etc.

[1] The statistics will be updated when updated information is available.

Fig. 8. Summary status of CAT I, II and III re-survey areas by 18 April 2013.

Country	CAT I	CAT II	CAT III	Remarks
Denmark	2013	2030	Not spec	
Estonia	2018	2028	2032	
Finland	2015	2015	2030	
Germany	2019	2020	N/A	Periodical 5 – 25 years
Latvia	2010	2025	2045	
Lithuania	2015	2010	2041	
Poland	2015	2017	2020	Periodical 5 – 25 years
Russia	2018	2018	2017	
Sweden	2020	2020	Not spec	
Latest year	2020	2030	See Note	

Table 3: Summary of time schedules of National Re-survey Schemes, by 18 April 2013.

Note: *CAT III re-surveys are for other purposes than safety of navigations. Time schedules for CAT III surveys are depending on funding arrangements. Due the moving seabed certain areas need to be re-surveyed between 5 - 25 years.*

Funding of re-surveys

All BSHC Members are planning to fund their national re-surveys through their government. There are some fixed plans for some countries to complete their CAT I and CAT II re-surveys. Some countries are also using external funding for speeding up their re-surveys, e.g. Finland and Sweden are using EU TEN-T co-funding. There are preliminary plans to seek future EU TEN-T funding for 2014 - 2020.

Implementation of re-survey plans

The BSHC has identified the following actions to ensure the implementation of National re-survey plans according to the estimated time schedules:

- All BSHC members commit to the implementation of their re-survey plans
- Seek External funding, where feasible
- The BSHC Monitoring Working Group to continue its work

The BSHC has identified the following follow-up actions to monitor the implementation of National re-survey plans:

- BSHC to monitor the progress of implementation at its annual Conferences
- BSHC to report annually to HELCOM on the progress of implementation

National Re-survey Plans

National Re-survey Plans are included as Annexes to the *Baltic Sea Revised Harmonised Hydrographic Re-survey Scheme Version 4.2.*[2]

References:

[1] HELCOM Copenhagen Ministerial Declaration, 10 September 2001

[2] AMENDMENTS TO ANNEX IV "PREVENTION OF POLLUTION FROM SHIPS" TO THE HELSINKI CONVENTION. HELCOM Recommendation 22E/5, 10 September 2001

[3] Major shipping routes and harbours. HELCOM EXTRA PREP 3/2001 Document No. 2, 3 August 2001.

[4] HELCOM Moscow Ministerial Declaration, 20 May 2010

[5] Vision for the Revised BSHC/HELCOM Re-survey Scheme. Supporting document to Moscow Declaration, 20 May 2010.

[6] Background information on revision of the 2001 Copenhagen Declaration regarding BSHC/HELCOM Re-survey Scheme and ECDIS training. Supporting document to Moscow Declaration, 20 May 2010.

[2] Document available within the BSHC MWG Members and the Hydrographic Offices, not attached as an Annex to this document.