

## Additional questions to HO's regarding depth contours and soundings

## Q.1

Most of the countries in the Baltic Sea have a kind of inconsistencies related to depth contours and the density of soundings with some of its neighbouring countries overlapping paper charts or adjacent ENCs.

- Describe the differences
- Describe the possibilities for harmonisation of such differences

# Denmark

## Describe the differences:

The chosen of depth contour intervals are different from our neighbouring countries. That gives us the differences in the paper charts and the adjacent ENC's bordering Germany and Poland.

We don't have the same problems with the bordering countries, Sweden and Norway. In the deep sea bordering Norway are we using the same contours. Bordering Sweden, we have as an example agreed to use the same contour in the Sound (15 meter contour).

The density of soundings are in some areas also presented differently from our neighbouring countries. This is caused for instance by the way that we have produce our ENC's. All our ENC's are produce by use of paper charts as source and from different scales. That gives us the same problem to none bordering ENC's. Another reason is the use of SCAMIN. We haven't yet implemented SCAMIN in the ENC's. No use of SCAMIN together with different source scale are the main reason for the inconsistency of density of soundings.

# Denmark

**Describe the possibilities or harmonisation of such differences:**

For the future we have to make bilateral agreements with our neighbouring countries. To harmonise the depth contours and the density of sounding require a resurveying of the affected bordering areas. It will then move the inconsistency to other areas until all areas are resurveyed.

# Finland

## Describe the differences:

Between Finland and Sweden:

1. Sweden has 15 m contours and depth areas, Finland don't have (except chart 935 Sea of Åland traffic route 1:100 000).
2. Sweden has 0-3m, 3-6m and 6-10m depth areas, Finland has no depth areas under 10 meters.
3. On Finnish charts soundings are more dense.

Between Finland and Russia:

1. Russia has 0-5 and 5-10m depth area, which Finland don't have.

Sometimes depth contours don't meet at the border (with all countries).

# Finland

## Describe the possibilities or harmonisation of such differences:

More cooperation with neighbouring countries.

When making changes to border area, notification to neighbouring country.  
Exchange of chart data or even survey data, when needed.

Amount of soundings could be decreased, if there would be more depth contours or depth areas in use.

Different countries should have similar way to select soundings.

If both countries have new survey areas taken to hydrographic database, there are no problems – data matches with neighbour country.

Do use approximate contours if necessary at the border to connect contours between two countries.



# Germany

## Describe the differences:

Following differences were found:

- Different depth ranges
- Different density of soundings
- Different usage bands and compilation scales at adjacent cells
- Different surveys or different age and technique of survey leading to different depth contours

See file images.doc

## Describe the possibilities or harmonisation of such differences:

- Agree on defined depth ranges
- Agree on a defined density of soundings at compilation scale
- If a waterway is split by adjacent cells belonging to different HOs trying either to agree that one HO makes a cell of the whole area or at least make sure that the same survey is used on both sides and try to agree on a common usage band and compilation scale

# Latvia

## **Describe the differences:**

Depth contours are denser than neighbouring country. Soundings are denser than neighbouring country on the ENC and Paper charts.

## **Describe the possibilities or harmonisation of such differences:**

We are already working on it by harmonizing the intervals of depth contours in adjacent compilation scales of ENCs and Paper charts.



# Sweden

## Describe the differences:

- A depth contour can end suddenly
- Bad matching of contours at borders
- The grade of generalization can switch over the borders, and by that the density of soundings and how smooth the contours are

## Describe the possibilities or harmonisation of such differences:

Define what inconsistencies in depth contours and density of soundings are. Identify the areas with differences. List the areas and put them in priority after how important the information is for the users.

How the actual harmonization shall be done:

- Communicate
- Depends of the area and how source data can be accessed
- Similar rules in how to generalize data. Automatic or/and cartographic process? How is data handled from the source (survey data) – grid sizes contra chart scale, generalization of the grid.



## Q.2

### Bilateral agreements

- If the Hydrographic Office have made bilateral agreements with neighbouring countries. List the countries:
- Do these agreements take care of generalisation of depth contours?

## Bilateral agreements with:

### Denmark:

Sweden, Germany

(Outside the Baltic Sea: Norway and Great Britain)

### Finland:

Sweden, Estonia, Germany, UKHO

(Negotiations with Russia has been started.)

### Germany:

Denmark and Poland

### Latvia:

(Preparing with Estonia and Sweden)

(Start talks with Lithuania)

### Sweden:

Finland, Estonia, (Latvia), Denmark



## Do these agreements take care of generalisation of depth contours?

### Denmark:

NO, The bilateral agreements are only dealing with exchange of charts, data, royalties....

there has been case to case agreements such as data exchange in Øresund with SE and a 17m contour in the traffic separation zone in Kadetrenden with DE.

### Finland:

NO, Bilateral agreements are on general level, generalization of depth contours hasn't been explicitly defined.

Agreed case by case. for example with Sweden: chart 935 at *Sea of Åland*.

Continuing

## Do these agreements take care of generalisation of depth contours?

### Germany:

YES and NO, With Denmark we had discussions about the *Kadetrinne*. We agreed on the 17m depth contour and the setting of depth ranges.

With Poland we agreed about the course of the border and details in chart content like DRGARE or DEPARE, buoyage and so on. This was an informal co-operation between the Polish colleague and me.

### Latvia:

NO, When You can see the whole picture working on product You try to harmonize the product automatically, by learning from others and seeking answers to questions due course. Can state it in bilateral agreement later as Appendix if needed.

### Sweden:

No, but there has been case to case agreements such as data exchange in Öresund with DK and a 13m contour in the traffic separation zone in Åland Sea with FI.



## Q.3

### Vertical datum

- All members of the working group are using Mean Sea Level (MSL) as sounding datum for their surveys. Does the datum refer to a known and defined zero?



## Does the datum refer to a known and defined zero?

**Denmark:** YES, Denmark refer to a zero called DVR90. This datum are close to the datum EVRF2000. The datum are well defined and could be harmonised to a common datum for the Baltic Sea.

**Finland:** YES and NO, In future maybe N2000. Defined zero -case is not so easy to define with old soundings... Zero isn't shown on the charts.

BSHC Chart Datum Working Group handles this matter.

**Germany:** YES, This is a topic of the BSHC-Chart datum working group (CDWG). They are looking for a reference to a common level. Further information is to be obtained by [Jukka.Varonen@fma.fi](mailto:Jukka.Varonen@fma.fi)

Continuing

## Does the datum refer to a known and defined zero?

**Latvia:** YES, The BHS 77 (Baltic height system)

**Sweden:** MSL2000 is used for the depth database. In the products (chart/ENC), depth data is referenced to a MSL-year. The MSL-year varies from chart to chart.

The mareographs that define the MSL are connected to a geodetic datum.

## Q.4

### Additional depth contours

- Beside of the general depth contours in the charts and ENC's, does it exist of any additional contours in some of the products, for example in harbour areas?



## Existence of any additional contours in some of the products:

### Denmark:

YES, Only the 17 metre depth contour differ from the recommendations of M-4. We have agreed with Germany to use the depth contour in *Kadetrenden*. An area with a deep water route.

### Finland:

YES, 13m and 15m at chart 935 *Sea of Åland*.

In over 10m two-way route part areas, the minimum depth of depth areas is the same than the depth of the two way route part (only ENC).

### Germany:

YES, We have a 17m depth contour in the *Kadetrinne* and in some shallow waters round *Rügen* we have 3m contours mainly in order to assist pleasure boats.



## Existence of any additional contours in some of the products:

**Latvia:** YES, 17m depth contour was made from the latest surveys in the *Irbe strait* for the port authorities request.

**Sweden:** YES, In several harbour areas, one or two additional contours exist in the products. These contours have been added after request from the harbours. The fairway in *Lake Mälaren* has a 7.6 m contour.

Q.5

Detailed products

- Has there been any request within the HO organization or other governmental administration for a product with a dense printing of depth contours, for example with equidistance of 1 m, in limited areas?



## Request for a product with a dense printing of depth contours:

### Denmark:

NO, We haven't had any request for such a product. We have discussed the possibility to optimize our ENC's with the use of equidistance deep contours. Again It will require a resurveying

### Finland:

NO, Only hopes and dreams... Customers keep asking occasionally.

We have made some special charts for pilots or some other customers, where is a coloured raster of bottom topography as background.



## **Request for a product with a dense printing of depth contours:**

### **Germany:**

YES, We produce so called bENCs. They appear irregularly and consist of direct surveys. BENCs are published only few days after survey and have only very little cartographic processing. Of certain interest are real depths in areas with maintained depth. At the time bENCs are produced for some areas in the Elbe river, only and their users are pilots and vessel traffic centres.

Additionally there are some requests to produce AML-CLB in the future.

### **Latvia:**

YES, Port authorities, constructors.



## Request for a product with a dense printing of depth contours:

### Sweden:

NO, There hasn't been any request for a "bathymetric model". In Sweden, with tides caused mainly by weather systems, and negligent influence by celestial bodies, it is probably no need and also more difficult to predict the under keel clearance beforehand.

A beginning would be to introduce a contour in the respective fairway areas that describe the maximum depth the fairway has been planned for.

A 3D-view of the fairway, with continuously information about the current clearance would give the navigator a better understanding about how it actually looks like under the water surface, and by that a more careful navigation at some places.