

Minutes of the

# Nordic Chart Production Expert Group, NCPEG 2019

20-21 November 2019

Norrköping



## 1. Introduction of participants

Magnus Wallhagen, Production Manager at the Swedish HO, welcomed all to Norrköping.

Participants presenting themselves.

### List of participants:

#### Denmark:

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## 2. Summary of Action Points from the 2017 meeting

Action No	NCPEG Action	Delegate	Notes	Status: N = Not started O = Ongoing C = Completed
15-03	DK to consider applying for INT status on Greenlandic charts	DK	No INT chart for Greenland	Ongoing
15-08 (ref action 13-05)	For the next meeting, more specific topics to be put forward before the meeting, so HOs can investigate and present their views and thoughts	All	Already in TOR	Completed
17-01	TOR to be updated and forwarded to NHC for approving	NO	Replaced by new action point 19-01	Not Started

17-02	Give feedback on Education project and future plans	SE	-	Completed
17-03	Report from the 2017 NCPEG meeting sent to all and to NHC	NO	-	Completed

### 3. Current practices of producing charts and publications in the Nordic HO's

#### Sweden:

(SE Status 2019.pdf)

##### *Organization*

The HO, AO Sjögeografi, is a department within the Swedish Maritime Administration, SMA. Employees: SMA 1200, Sjögeografi 113.

There are four production groups at Sjögeografi: Survey, Source Data, Hydrographic Data and Product Coordination.

Thomas Gränne is head of Product Coordination: NtM Office, ENC, Paper Charts, and other products. Hydrographic data is responsible for the actual production of ENC.

##### *Production since NCPEG 2017*

- 84 NE charts have been published (19 with BSCD2000)
- BA Adopted Charts
- 12 Small Craft Charts
- A new version of the INT1
- Small craft educational charts
- Blank charts (used for Pilot examines)

Declining number of charts sold (15-17000 annually)

Sales of BA adapted charts fluctuate a lot, lately a quite dramatic downturn.

Sales of ENC increasing.

##### *Highlights since 2017*

- Information Management established to comply with System Management to facilitate decision-making and to ensure quality in information.
- Cartographic guidelines for depth information established.
- Training in CARIS HPD and general training for new employees.
- All products have been migrated to new chart production system, CARIS HPD.
- New Limits and Boundaries issued, now also presented in ENC.
- ADAPT – a co-funded project to survey areas in Stockholm Archipelago used by public transport. A result of the project is new and improved ferry routes and better hydrographic data in products.

#### Finland:

(FI Status 2019.pdf)

##### *Organization changes*

The Finish HO is since beginning of 2019 part of TRAFICOM, a transport and communication agency. The agency is mainly tax funded. Employees: 1000.

The HO is within the Vessels department of TRAFICOM. Organized in three groups: Hydrographic Survey Data Management, Nautical Chart Data Quality Assurance and Nautical Chart Data Management.

### *Production*

23000 charts sales annually, 4050 users of ENC

### *New hydrographic process*

A data-orientated workflow (data in – data out). Input to the maintenance of chart data and chart products are new bathymetry and various waterway decisions and maritime prohibitions and restrictions. Output is publishing of paper charts and ENC including S-102 distribution (tested in simulator), chart data, survey data and other products, such as INT1, List of light, product catalogue.

### *The AHTI project*

A project for renewal of the chart production system started in late 2014. The implementation has been running for 2 years and the system, named AHTI, was set in production late 2018. AHTI consists of the CARIS HPD Suite. Together with MERTA, which is the Survey Data Management System (CARIS Bathy DataBase), and LOKI, a Source Data Management System, AHTI makes up the Source Data Management and Chart Production systems.

LOKI, which is a browser-based tool, is integrated with CARIS Project Manager. Changes in LOKI generates projects for updating of source data and subsequent product updates.

An interface between AHTI and the Navaid registry, VATU, enables queries to find updates of Navaids. The VATU updater is integrated with LOKI to create updater projects.

### *Challenges:*

- Data migration from the old customized data model to the current S57 environment.
- Interaction with VATU and LOKI.
- Differences in vertical datum in the same area.

### *Improvements:*

- Survey data and chart management from the same company
- Faster data processing from depth model to chart
- Improved tools for contour generation and sounding selections
- Better tools for creating EN and ER products
- S57/S-101 based data model , with optional additional feature classes and attributes
- Management of system lifecycle and decreased number of extensions
- No locking of features in chart database

Project scheduled to end 31.12.2019. Outstanding issues/tasks:

- Portrayal files and cartography migration
- Product templates (CARIS)
- Finalize VATU-updater development (CARIS)
- Data migration of military AHTI (file based)
- Specifications for the TRAFICOM Citrix environment (CARIS)
- Remaining bug fixes

### *Experiences:*

- Save resources in the procurement process by learning from similar projects and make use of tendering services and system expert consultants
- Important to have proper scale and grounds for scoring in the procurement phase
- Design phase takes time
- Migration of data takes lots of resources
- Useful to have a technical person in customer's project group who knows the design of the old system.

**Norway:**

(NO Status 2019.pdf)

*Organization*

There has been a restructure of the Nautical Department, NHS, at Kartverket. One level in the organization has been removed and a new section, Nautical Chart Authority, has been formed.

Employees: 130 in NHS, 17 in Chart Production section.

*Conference*

An annual Nautical Chart Conference is held by NHS with around 100 participants representing the Navy, Nautical Education Sector and NHS. Used as a forum to get feedback and requests from users and to discuss and inform on current topics. This year the Digital Pilot Guide was launched at the conference.

*Production*

No big production changes since 2017. 1250 ENC's 233 Printed Charts.

Digital Pilot Guide was released 11/2019. Ongoing work to move information from the printed publication "Den norske los" (which is not updated anymore). Harbour authorities are starting to add their data to the digital version. The guide is a freeware available at [dnl.kartverket.no](http://dnl.kartverket.no)

In Norway, sector lights are being switched to IALA standard. This affects around 1200 sector lights.

The Marine Geospatial Maps Project – MAGIN: Near coast surveying and charting. The project aims to harvest the potential value of coastal areas. The high density data collected will be used for research; environmental, social and economic decisions and policies. The project starts in three pilot areas covering 1600km<sup>2</sup>. Critical data will be used to update paper charts.

*Data Management*

A Primary database and C-maps' dKart Editor and Publisher are used for ENC and paper chart production.

*2020*

- New edition of Chart no 1 will be published (Iddefjorden has been surveyed).
- Svalbard, surveying and new charts in Storfjorden
- Fairways, sailing routes for Norwegian Coastal Administrations recommended sailing routes.
- Coastal charts in Troms and Finnmark
- Place names, compliance between database, ENC, paper charts and overlapping areas.

**Denmark:**

(DK Status 2019.pdf)

*Organization*

The Hydrographic Offices are a part of the Danish Geodata Agency, GST, currently divided in two divisions: Danish HO and Danish HO Arctic with jointly 120 employees. Two production teams in Danish HO (ENC and Paper charts) with 12 employees.

*Production*

63 Danish Paper charts, 8 Faroe and 94 Greenlandic. 252 Danish ENC's, 21 Faroe, 95 Greenland. Also produces Repromats, GIS-data, Geotif files and publish Chart Corrections, Harbour Pilots. Special assignments for Pilots and Defense.

GST publishes Den danske Havnelods, Harbour Pilot Guide. Available as freeware: [danskehavnelods.dk](http://danskehavnelods.dk)

NtM: The Danish Maritime Authority publishes Notice to Mariners. Notices affecting charts are published as Chart Corrections by GST.

Surveys: The Arctic HO conduct their own surveys, for Danish waters, Faroe Island and waters around Greenland.

2020:

- The two HO divisions currently use two different chart production systems. Next year the Danish HO will change system to ESRI Maritime, same as HO Arctic is currently using. Plan to migrate ENC by mid-2020 and start migrating paper charts end of 2020.
- Routing project Kattegat. New and adjusted traffic separation schemes, new and adjusted routes. Affects 11 paper charts.
- Challenges ahead: New production system, knowledge gaps to fill since relocation of GST to Aalborg, new organization and new standards (S-100).

**Iceland:**

(IS Status 2019.pdf)

#### *Organization*

Change in the Coastguard's organization, 6 divisions became 3 (aviation, navigation/maritime, defense). The HO, Hydrographic and Maritime Safety Department (ICG-HMSD) has 6 employees, Árni will be appointed head of the department.

#### *Publications*

- 41 Printed paper charts 41 and 39 harbor plans 39 printed-on-demand in-house
- 73 ENC cells
- List of lights
- NtM (average 30-40 notices/year)
- INT1
- Tide table
- Catalogue of charts
- Sailing directions (incl. a chapter in UKHO Arctic Pilot)

#### *Data Management*

File based management of source data and chart data.

All charts in CARIS PCC 2.1, six new editions fully completed since change from CARIS GIS. CARIS BASE Editor to be fully implemented in the chart production process.

QC procedures in-house developed. Plans for ISO 9001 certification.

#### *Education*

CARIS HIPS & SIPS Training Course. 2 surveyors have attended Hydrographic Survey Cat B. Planned education for CARIS Bathy DataBase and general training in 2020 as new staff will be hired in 2020.

## 4. Focus: Depth Information

*Procurement of a software for generalization of bathymetric data (Klas Östergren)* (Procurement software.pdf)

SMA Procurement.

(Kartografiska riktlinjer.pdf)

Short term goal

- To simplify manual work by guidelines and manage pile of surveys

Long term goal

- Efficiency, harmonization, new high density products

Requirements based on the cartographic guidelines, hence it is easier to evaluate and grade how the software performs. Set guidelines is one way inheriting the experiences in compiling hydrographic data from experts to employees with less experience.

Evaluation in two steps: 1) Review on delivered generalized data (based on SMA's raw data).  
2) Review of User friendliness by demonstration video.

#### *Rolling coin method (Teppo Kuusijärvi)*

(Coin Roller method.pdf)

Goals for the new bathymetric data management system, MERTA:

Efficiency, atomization, separate classified data and unclassified, produce data for S-102 depth model.

Rolling coin algorithm:

- Currently used in production at TRAFICOM.
- Smoothing/manipulating algorithm
- Never cuts a cell in the depth model, always goes on the deeper side
- Cell-size and rolling coin radius adjustable
- Better to increase cell-size than increasing rolling coin radius
- Smoothing contours necessarily for paper charts

TRAFICOM uses set parameters (cell-size and rolling coin radius) in production for each scale band. The algorithm used for multibeam data only.

#### *General discussion on generalization*

General aim: good quality, safe contours, as fast as possible!

In Norway, a similar project is ongoing. Looking into using same raw data for all usage band.

In Denmark, generalization software SCALGO is used for production of Greenland charts.

#### *Dense depth contours in ENC (Gjermund Bakken)*

(Dense depth contour in ENC.pdf)

ENC and dense depth contours. A solution within the S-57 standard.

Challenge:

- Today ENC consist of only specified contours and scattered soundings, similar to paper charts. How to show depth information in an optimal way?

Example of test area:

Lovisenbergsundet. Vessel restrictions in the area max depth 5.8m, area new multibeam data available. Resulted in new ENC-cell (Berthing) with depth contours 1m interval down to 15m. Released 2018. In the same area an inset was made for the paper chart from the same data (specified depth contours and no smoothing).

*ENC utveckling.* Project started May 2019

Goals

- Give users a better ENC with high-resolution bathymetry
- Optimize chart production line

Project plan

- Produce and make prototype (2019/20)
- One full dataset (user bands 4-6)
- Create new production line (2020)

Preconditions

- Release of depth data 0-30m
- Fully surveyed areas.

## Challenges

- Large amount of data makes large files
- Visibility of small ring curves.

## Challenges for new chart production line

- Data management
- Selection of depths and shoals
- Where does it make sense to have dense depth curves?
- Production of paper charts.

## Gains

- More new surveyed data available in charts
- Detailed ENC's
- Route optimization
- Improved work processes and faster production internally.

## *Discussion of quality information in ENC's and Paper Charts*

(Source diagram.pdf)

A general discussion on how quality information is shown in ENC's and Paper Charts resulted in a request to all participants, see action point 19-02 below.

## 5. Focus Future

### *The future of the paper chart*

Each HO's view on the future of the paper chart:

#### **Sweden:**

Swedish Navy requires paper charts. Leisure craft sector is an important customer. Automation and overview of portfolio possible solutions to streamline production.

#### **Norway:**

Brought up the issue on authorization for private sector plotters, the aim has to be safety of navigation. Also addressed the issue on scale when creating paper charts from ENC? (ie 1:22 000 ENC, 1: 50 000 paper chart)

#### **Iceland:**

Considering producing Band 6 (Berthing) ENC's without equivalent paper chart. Main concern is safety of navigation, not optimizing portfolio/production. No financial gain in production of ENC and paper charts. Mainly non-SOLAS customers, hence paper charts are sold. ENC customers are mainly foreign fleet.

#### **Denmark:**

Danish Navy requires updated paper charts, hence probably no big changes in paper chart production. Liability issues, what do we publish for vessels that do not require ENC?

#### **Finland:**

Migration and portrayal with HPD, a lot of work to produce paper charts. Would like to see electric chart or plotters as backup system. Problems with updates.

## *Criteria for New Editions of ENC and Paper charts*

#### **Sweden:**

ENC: Continual update of ENC, NE due to technical reasons.

Paper chart: NE criteria: 50 updates, 5 critical, all surveys prepared for the charts. Currently there is a pile of surveys which limits the issuing of NE's. Only NE are published (no reprints). Distributors can have a subscription. As a new edition is issued, a spot-file is sent to UKHO (adopted charts).

#### **Iceland:**

ENC and Paper Chart NE are issued at the same time.

ENC temporary updates valid shorter than 3 months are not issued.

Paper Chart NE criteria: New surveys; land information; decision made from experience, e.g. new depths, change to a light, construction work, landfill, new quay, dredging. Selectively issues blocks for correction in NtM.



**Norway:**

ENC: Continual update of ENC, NE due to technical reasons.

Paper chart: Continual updated of charts, published for PoD every fortnight. NE criteria: New survey, critical updates, more than 30 NtM and also age, if more than 8-10 years (but not exclusively due to age). Issues tracings in NtM.

**Denmark:**

ENC: NE due to technical reasons.

ENC and paper chart published at same time for new surveys. NE criteria: 30 corrections, block corrections on top of each other. Issues block corrections to facilitate quick releases of changes.

Paper charts distribution by private printing office. 40 charts adopted by UKHO.

**Finland:**

ENC and Paper Chart NE are issued at the same time, as well as the NtM (or shortly after)

Paper Chart: NE criteria: New bathymetry, major changes to coastline, fairways, aids to navigation. Will start doing reprints (due to new production process). Issues block corrections (very useful in small craft charts). In the future, each panel (page) in the leisure craft portfolio will be a product, giving users the possibility to buy a single sheet. Planning for PoD (distribution by printing houses), to deliver updated files in same intervals as NtM

*Criteria regarding Notice to Mariners*

(Prioritering\_kartoppdateringer\_EFS.xlsx)

Norway presented a new method of classifying and prioritizing notices and updates.

Updates are classified in a hierarchy according to the type of affected object, type of update, geographical location and status. The classification is weighed to give a guide to which updates should be issued as a NtM and to prioritize updates.

## 6. Focus Methods and Education

*Routeing systems –Kattegat, publication of X-charts (Klas Östergren)*

(Use of X-charts.pdf)

**Background**

60000 vessels passing Skagen and 30000 in the Sound annually. Decision on a new routing system by IMO 2018.

**X charts**

Used when larger changes needs to be published in charts before it has come into force. The old edition of the chart will be given a prefix "X"

In ENC DATSTA and DATEND will be used.

**Challenges**

Administration and challenges for the mariners (any updates have to be made in both charts).

UKHO have been consulted as they have previous experiences from this.

The new editions will be published 1<sup>st</sup> of April (Denmark) mid of April (Sweden). 11 Danish charts and 9 Swedish charts are affected by the new routing system, Sweden will use the X-charts method for four charts.

**Communication strategy**

NtM, leaflet handed out by pilots, articles in major boating magazines, navigation warning in the area.

*Baltic Sea Chart Datum 2000 (Elisabeth Svensson and Teppo Kuusijärvi)*

(BSCD2000\_SE.pdf)

**Sweden:**

(N2000\_FI.pdf)

Initial goal to finish December 2020, revised to December 2024.

Currently working in Stockholm area where new surveys are included in the project. The National shoreline is updated ahead of BSCD 2000. Work completed in Bay of Bothnia and most of Sea of Bothnia.

**Finland:**

Benefits: Bathymetry and fairway draughts in the same vertical datum, enable smooth navigation, no best-before-date from bathymetric data.

Impacts: Bathymetry, maximum authorized draughts, depths of swept and dredged areas will change. Water level information will be available in two different datum during this period.

The implementation will start 2020 and run for 6 years. Only charts in new datum will be published as a NE (unless very big changes). Plan to publish 50 chart, including small craft charts, 2020.

**7. AOB***Public access to nautical information (Annika Kindeberg)*

Annika explained how SMA handles the distribution of data to external web-based services.

In Finland, Iceland and Norway the HO's have web map services showing paper charts.

*EU-directive 2019/1024PSI, Public Sector Information (High Value Data Set)*

SMA has decided not to include navigational charts in the valuable data sets. As a chart is a legal document, we need full access and control over the production of chart data.

Norway: Delivers data models with 50 meter resolutions to INSPIRE

See action point 19-03 below.

**8. Summery, Closing of meeting**

List of actions

(Completed actions removed)

Action No	NCPEG Action	Delegate	Notes	Status: N = Not started O = Ongoing C = Completed
19-01	Comments on changes and additions to TOR	All	Action given by NHC. Arní to bring draft to next NHC	Not Started (Feb 2020)
19-02	Give brief status on how quality is presented in ENC and Paper Charts.	All		Not Started (Feb 2020)
19-03	Give brief description on approach to PSI	All		Not Started (Feb 2020)
19-04	Report from the 2019 NCPEG meeting sent to all and to NHC	SWE		

Next NCPEG meeting will be in **Finland** in **2021**