

# National Report of Finland

(31 January 2005)

## General

### Administrative and Organisational Status

The Finnish Maritime Administration is developing its operations. Two separate state owned enterprises started on 1<sup>st</sup> of January 2004. The ice breaking, the operating of large buoy tenders and the pilotage operations have been separated into state owned enterprises, called Finstaship<sup>1</sup> and Finnpilot<sup>2</sup>. The FMA has now about 800 persons with the budget of about 100 Mill €. About 610 persons have been moved to the Shipping Enterprise and about 390 persons to the Pilotage Enterprise.

The separation of the organisation of the FMA to ordering (administrative) office and internal production unit was prepared during 2004 and was finished during the last quarter of year. The new production unit is responsible for hydrographic surveys, and for chart production and fairway construction and maintenance. The district organization of the FMA will also be changed, but that will cause only minor effects for hydrography.

### Hydrographic Department

- **The Director and Staff** (4)
- **Hydrographic Surveys Division** (3)
- **Charts Division** (14)
- **Hydrographic Information Division** (21)

### Internal Production Services includes

- **Survey Production Division** (12 + 28 survey officers on board vessels). In addition 45 + 35 persons are contracted from Finstahip (Shipping Enterprise).
- **Chart Production** (19)

The yearly budget of all these units is between 10 – 11 million €.

### Strategic Plans

The Hydrographic Department has proceeded according to the FMA's strategy for the Hydrographic activities. The main features of this

<sup>1</sup> **Finstaship**, see more on <http://www.finstaship.fi/?l=en> .

<sup>2</sup> **Finnpilot**, see more on [http://www.finnpilot.fi/index.phtml?page\\_id=10148&navi\\_id=10148&en=1](http://www.finnpilot.fi/index.phtml?page_id=10148&navi_id=10148&en=1)

strategy are: To be able to efficiently produce accurate and error free hydrographic data for the anticipated needs of safe navigation for commercial shipping and for other official purposes. For the anticipated needs of the society, depth information and nautical charts will be produced on all Finnish sea areas and on specified inland lake areas for increasing their use and for safe navigation.

The new organizational structure of the FMA includes two branches; the administrative organ (orderer) and the production units. The private companies are the third party of this new strategic outline. During 2004 the FMA prepared a specific Long Term Plan for both orderer and producer to adjust their functions and models for operations considering the opening markets. The private companies in Finland and abroad were also asked for their tentative willingness to develop their activities for both Hydrographic and Fairways maintenance services. It is also outlined in this plan that if in the future the internal production of the FMA would be developed to a more commercial based organization, the production of primary nautical charts and ENC's will remain in the FMA's administrative organ.

The Hydrographic Department is preparing the Hydrographic Programme for 2005 - 2015. This will be based on an extensive analysis of the needs of the navigation and other activities of the society. It includes an analysis of the current situation, prioritized areas where new hydrographic surveys are needed and new nautical charts to be published. It also includes the proposed time schedule and cost estimations for the future actions. The first draft of the Programme is now for review inside the FMA.

The implementation of the Navi Programme is going on. The hydrographic processes and functions have been analysed and described during 2004. The FMA has anticipated to make a decision how to proceed towards a Quality Management System in 2005.

### **Bilateral Arrangements**

No news.

## **Status of Hydrographic surveys in Finland**

### **Survey results in total in 2004:**

- 365 km<sup>2</sup> single beam echo soundings
- 3,2 km<sup>2</sup> surveyed with bar sweep method
- 120 km<sup>2</sup> surveyed with echo sweep method
- 1723 km<sup>2</sup> surveyed with multi-beam method
- 390 geodetic control points measured
- 77 fixed aids for navigation measured

The operational costs for hydrographic surveys were 7.5 million € (Hydrographic Surveys Division in Helsinki included)

### Survey vessels of FMA Hydrographic Department 2004

Vessel	Type / length	Multibeam launch	Other survey launches	Crew during season	Operation area
<b>Prisma</b>	Depot ship / 57 m	M120	7	45	South & SW coast
<b>Saaristo</b>	Depot ship / 43 m	M640	3	33	Gulf of Bothnia
<b>Sesta</b>	Depot ship / 19 m	-	3	9	Lake Päijänne
<b>Airisto</b>	Survey ship/ 28 m	Echo sweep		12	Coastline
<b>Suunta</b>	Survey ship/ 36 m	Multibeam / SeaBat 8111		14	Coast & open sea
<b>Kaiku</b>	Survey ship/ 22 m	Multibeam / SeaBat 8101		5	Lake Saimaa

The two multibeam launches of **Prisma** and **Saaristo** are similar 15 m type launches equipped with SeaBat 8101 multibeam. The newbuilding 2003, s/v **Kaiku**, made a full and successive season at Lake Saimaa area, but she is capable for surveys on the coastal areas, too. The draft of the catamaran type ship is 1.3 meters and the minimum survey depth in practice is about 2 meters.

The geodetic survey team belongs to **Prisma**, but works independently on all areas of Finland. The main tasks of the team (9 persons) is the survey of control points for the new EUREF-FIN coordinate frame and the survey of fixed aids for navigation.

The continuation of the re-survey of all fairway areas is the main objective of surveys (Navi-project). This task is enlarged now to the surveys of open sea lanes (HELCOM survey plan). General surveys for new/ renewed nautical chart production was continued and also fulfilled on Lake Päijänne. Depot ship Sesta and her launches were transported at the end of season to Lake Saimaa.

All the survey data is collected and processed in digital form. The data bases for bathymetric data (SYRE) and for controlled areas of depth (VARE) are fully used in production. The Maritime Districts of FMA have also some amount of survey capacity for fairway surveys (Navi and fairway construction). The results of these surveys are also collected into these survey databases. A special Navi Task Group is working for the harmonization of survey methods and preparing quality assessment procedures.

A feasibility study was performed for comparison of different vessel hull types suitable for open sea surveys on shallow areas of the Finnish coastline. A normal monohull construction was found to be the most cost effective especially in case that the existing s/v Airisto would be modernized and equipped with MBES. The construction plan and call for tenders of this shipbuilding task was prepared at the end of 2004. The approximate costs for this will be 2 million € and the modernized ship should start surveys in 2006.

The BSHC/HELCOM Coordinated Hydrographic Re-Survey Plan has been updated with the survey results of the season.

### **Processing of survey data**

The survey data is processed and prepared for Navi-registers both onboard the survey expeditions and in the office. Surveying and data processing in expeditions are supported and supervised by responsible persons in FHO.

There are eleven persons in the survey process performing data processing full time and in addition five persons as a part time (e.g. data cleaning, quality checking during surveying, registration).

Data generalisation, validation and quality checking against surrounding data takes place in the FHO in Helsinki as well as registration into databases after survey process. The soundings are stored as original soundings in the Sounding Database System. Sweepings with related features are located in the Controlled Area Database System. Data processing systems and databases are developed further and maintained by FHO.

## **Status on production of Nautical Charts and Publications**

### **Cartography**

In the beginning of 2003 started one of the most significant developments in the Finnish chart production history. Modernised charts are replacing traditional Finnish nautical charts. In this way, Finland is gradually making the transition to the international INT charts. Colours, symbols and the coordinate system will be changed. The new symbology is based on the IHO standard. The modernised nautical charts are published in the WGS-84 coordinate system. Existing traditional charts will remain in the Finnish national coordinate system. The revision of the whole chart portfolio will be completed until the end of 2008.

New charts are produced by the new chart production system called *nSector*. The production line has been integrated with the HIS -system. The modernised charts are also available as raster products on CD-ROM.

The progress of this process has been as planned, there have not been any major drawbacks. The comments to the renewed charts have been very positive. So far 37 coastal charts, 3 harbour charts and 2 general charts have been renewed. The status of renewed charts and the situation in the year 2005 can be seen on the following table.

Production schedule for the modernised charts

Chart number	Sea area	Scale	Publishing date
13-22	Gulf of Finland	1:50 000	2003
191	Gulf of Finland	1:20 000	2003
23-34	Archipelago Sea	1:50 000	2003
952	Gulf of Finland	1:250 000	2003
40-46, 52-59	Gulf of Bothnia	1:50 000	2004
47-51	Gulf of Bothnia	1:50 000	2005
953	Archipelago Sea	1:250 000	2004
958 (INT 1209)	Gulf of Bothnia	1:250 000	2005
136, 138	Gulf of Finland	1:10 000- 1:20 000	2004
134	Gulf of Finland	1:10 000	2005
160, 169, 190	Archipelago Sea	1:20 000- 1:25 000	2005
125	Gulf of Bothnia	1:10 000	2005
410	Lake Saimaa (inland waters)	1:40 000	2005
A, B (chart series)	Gulf of Finland	1:50 000 (1:20 000)	2004
J (chart serie)	Lake Päijänne (inland waters)	1:40 000	2004
C, D (chart series)	Archipelago Sea	1:50 000 (1:20 000)	2005
G (chart serie)	Gulf of Bothnia	1:50 000 (1:10 000 - 1:30 000)	2005
M (chart serie)	Lake Saimaa (inland waters)	1:40 000 (1:20 000)	2005

The CHRIS Chart Standardisation and Paper Chart Working Group (CSPCWG) has the proposal for the fairway area on its Work Programme. Finland will send shortly a renewed the proposal. First the CSPCWG plans to complete the other open issues and then proceed with this one. Mr. Jarmo Mäkinen is the Vice- Chairman of this WG.

### Nautical publications 2005

Notices to Mariners are published every tenth day and are available also on the Internet. ENC charts are updated once a week based on the NtM material. Notices to Yachtsmen, which are compiled on the basis of the NtM, are published five times a year.

The new edition of the List of Lights on the Finnish Coast will be published in May 2005. General information is given in Finnish, Swedish and English, but the actual list of lights is only in Finnish and Swedish. The database will be updated continuously. The coordinates of all lights are given both in the Finnish national and WGS-84 (EUREF-FIN) coordinate systems.

The fourth edition of Chart 1 was published in May 2003. This edition contains all Symbols, Abbreviations and Terms used in modern (transition to INT charts, WGS-84) and traditional (KKJ) Finnish charts and in international (INT) charts.

A new edition of the Catalogue of Finnish Nautical Charts will be published in April 2005. The new sales Catalogue of Finnish Nautical Charts will be published in February 2005.

### **Navigational Warnings**

The FHO (Helsinki Co-ordinator), Turku Radio and the designated persons in the Maritime Districts maintain an up-to-date file for navigational warnings. Turku Radio (24h service) is sending the Finnish navigational warnings based on this. Navtex warnings will be sent to Baltico in Sweden and transmitted by Stockholm Radio.

The system is supervised and co-ordinated by The Hydrographer and Helsinki Co-ordinator, whereby the Finnish navigational warning practice constitutes a part of the international navigational warning system.

### **ENC production**

At the end of year 2004 there are 98 Finnish ENC cells on the market. These cells cover main fairways in Gulf of Finland and Archipelago Sea. The cells covering fairways to ports of Raase, Oulu and Kemi in the Gulf of Bothnia has been produced. Full ENC coverage (including most important fairways) from Finnish waters will be reached by the end of 2005 (including various navigational purposes). Full ENC coverage in navigational purpose approach will be reached during 2006.

ENC base cells are produced using tailor-made HIS (Hydrographic Information System) software. ENC updates are produced using SevenC's ENC tools ENC Manager and ENC Designer. Tools for validation of ENC's are dKart Inspector made by Hydroservices AS and ENC Analyzer made by SevenC's.

The distribution of the ENCs is done via PRIMAR Stavanger. The FHO has used the VPN service as a main data transfer tool. Also other services and tools (VRC, S57 Advisor, discussion group etc.) provided by PRIMAR Stavanger are used. The experiences of services have been very positive.

Several Finnish icebreakers, one research vessel and many commercial vessels are using the ENCs.

### **ECDIS promotion / Feedback**

Since the ECDIS seminar in October 2001 there have not been any active ECDIS promotion events for end-users. In May 2004 there was an informative and informal dinner for Finnish ENC distributors. FHO staff

has given few presentations and lectures during year 2004 including course in hydrography in Helsinki University of Technology (HUT). There has been some communication between FHO and end-users during 2004 to exchange experiences and receive feedback.

FHO took part work of Primar Stavanger Information Working Group (PSIWG) and received some positive feedback from Finnish maritime community regarding results of the working groups work.

## Hydrographic Data Management Systems Development

The storage and management system for bathymetric data (SYRE) is based on Oracle and in-house software. SYRE was designed and implemented by Finnish Maritime Administration and was based on FMA's *S2-depth storage system*. The system has been in productive use since December 1999. At the moment database includes about 3.8 billion soundings covering 7500 square km inland lakes and coastal waters.

The VARE database consists geographic information of controlled areas and meta data of all survey projects produced by FMA. The system has been in operational use and data have been systematically stored since 1997 on survey expeditions and since 2000 in district offices, e.g. all new bar sweeping areas are stored in VARE database. The system is built on Oracle® Spatial and Intergraph's GeoMedia.

The new system SYVÄ for selecting critical soundings and creating depth contours for charts from different depth information sources, e.g. SYRE; has been approved for production in Autumn 2004. This system is based on ArcGis software and SDE database. All underwater objects including coastlines will be exported from HIS-system to this new one and will be updated there.

The fairway register (VÄRE) is a central register for fairway information using modern GIS tools (based on Oracle/SDO and GeoMedia). The database includes navigation lines, fairway areas, dredging areas, dumping areas and restricted areas. The Fairway register complements the central navais database, VATU.

The Hydrographic Information System, HIS, (based on Oracle/ArcSDE, ArcView and ArcInfo 7) will be upgraded on the same level as NSector and SYVA (ArcGIS).

The FMA has one centralised chart data management system integrated with both ENC and printed chart production line. The Hydrographic Information System, HIS, (based on Oracle/ArcSDE, ArcView and ArcInfo 7) covers the data management and ENC production (only ENs) and nSector covers the paper chart production line. Both products are derived from a single source (HIS) that is centrally updated so that there are no discrepancies between the different products. The current version of the system (HIS 2.1) was taken into use in March 2002. Part of the system including tools for selecting critical soundings, creating depth contours and areas for charts from different depth information



sources, e.g. SYRE; has been renewed during 2004. These new modules are developed based on ArcGIS software and SDE database.

The HIS will be further developed during 2005 – 2006. The second phase of renewing project is focused on ENC production line (ER-line included in) and HIS data management. Development will be done with ESRI's ArcGIS –technology.

The chart corrections register ATA (based on Oracle and MapInfo) has been extended to cover all district offices of the FMA.

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Annex 1: The new organisation of the FMA from the 1<sup>st</sup> January 2005.



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