Dossier du BHI S3/8151/UPD

**ATELIER SUR LA MISE A JOUR DES ENC
Mobile, Alabama, USA, 3-4 mai 1999**

Référence: Lettre Circulaire du BHI 15/1999 du 24 mars 1999.

Monsieur,

Ainsi qu'il était expliqué dans la LC du BHI 15/1999, le Bureau a organisé un atelier sur la mise à jour des ENC à Mobile (Alabama, USA), les 3 et 4 mai 1999. Cet atelier auquel participaient 35 délégués de 18 Etats membres et de PRIMAR ainsi que 14 délégués de 11 grandes compagnies ou organisations concernées par les cartes électroniques s'est tenu aussitôt après la Conférence hydrographique des Etats Unis et la réunion intersession du groupe de travail sur la carte électronique de la Commission hydrographique des Caraïbes et du golfe du Mexique (CHCGM), organisées respectivement le 30 avril et le 1er mai 1999 sur le même site.

Vous trouverez ci-joint (en anglais seulement) le compte rendu succinct des discussions avec les recommandations faites ainsi que les actions proposées par l'atelier, la liste des documents, la liste des participants ainsi qu'un exemplaire de l'ordre du jour abrégé.

Le BHI pourra communiquer aux Etats membres qui en feront la demande un exemplaire de tout document présenté pendant l'atelier.

Veuillez agréer, Monsieur, l'assurance de ma haute considération.

Pour le Comité de direction,

Contre-amiral Neil GUY
Directeur

P.J. Compte rendu succinct des discussions (anglais seulement)

17 June 1999

Summary of Discussions

1. OPENING AND ADMINISTRATIVE ARRANGEMENTS

The Chairman (RAdm Neil Guy, IHB) opened the Workshop. He explained that the overall purpose of the Workshop was to discuss issues and problems related to the production, dissemination and implementation of ENC updates, and to provide recommendations for solutions. He advised that it was the intention to break the Meeting into small working groups, to consider issues raised in the first session. The recommendations of the working groups would then be considered by the entire workshop and actions identified. He drew the attendees' attention to the documentation available (re: doc. ENCUPD/1A rev.2). Approximately 50 persons were in attendance, representing 16 IHO Member States, the IHB, 10 commercial companies and one non-IHO Member State (re: doc. ENCUPD/1B rev.3). Dr Lee Alexander (P and H Marine Associates) served as Rapporteur for the Workshop.

2. APPROVAL OF AGENDA

It was agreed that all topics listed in the Abridged Agenda (re: doc. ENCUPD/2A rev.2) would be addressed. However, items 5 and 6 (appointment of sub-groups and reports back) would be dealt with after items 7 – 9 (production, dissemination and implementation).

3. PRESENTATIONS ON ENC UPDATING PROCEDURES AND EXPERIENCES

Several presentations were made by representatives of commercial companies or HOs, regarding their experience on electronic chart updating. Summaries are given below.

3.1 *ENC Updating in the Context of Regular IHO Hydrographic Activity* (re: doc. ENCUPD/3A), by Mr Andrey Sabajdash, Morintech, Russia.

Mr Sabajdash's presentation proposed an Open Progressive Data Exchange Concept. This offers a new approach toward organizing ENC updating. He noted that an Internet-based updating could be implemented.

3.2 *DNC Database and VPF Database Update (VDU)* (re: doc. ENCUPD/4.1A), by Cdr Mike O'Loughlin, NIMA-USA.

VDU will initially be a monthly service that will incorporate the NtM weekly updates. This service will be provided via CD-ROM.

3.3   *ASPO Systems' Experience with ENC Updates: Feedback* (re: doc. ENCUPD/3B), by Mr Hannu PEIPONEN, ASPO Systems Oy, Finland.

Four key issues were addressed in Mr PEIPONEN's paper:

1) Unclear aspects of the S-57 standard resulted in different interpretations of what an ENC is. The question of when a potential ENC is a legal ENC, was therefore possible.

2) Update-related coding practice problems;

3) General ENC coding practice problems;

4) Improvement of possible weak points in S-57 ENC Product Specification are needed (e.g., cancellation of text and picture files; how to detect encryption?; naming of ENC data sets).

Gert BUTTGENBACH (7Cs) recommended that the issues identified in Mr Peiponen's paper should also be referred to TSMAD. Michel HUET (IHB) confirmed that this paper was to be considered at the 4th TSMAD Meeting, Ostend, Belgium, 15-17 June 1999.

Note: Comments on Mr PEIPONEN's paper from Mr Smo Laitakari, Finnish Maritime Administration, were received at the IHB too late for their consideration by the Workshop. They are contained in Doc. ENCUPD/3B add.1.

3.4   *Technical Issues in Supporting Incremental Update Generation for ENC* (re: doc. ENCUPD/3C), by Mr Peter WOODSFORD, Laser-Scan, Cambridge, UK.

Mr WOODSFORD's presentation dealt with:
- Viewpoint of a technology supplier of ENC production systems;
- Continuous database (object-orientated database, versioning);
- ENC specifics (e.g., duration/frequence of transactions, "thin updates")

Conclusions:
- From the ENC production systems viewpoint, ENC is workable (EN and ER), but it still needs to improve operationally; in addition, not all attribution is implemented yet;
- S-57 is clearer than alternative standards;
- There is a need to filter out "teething troubles" in ECDIS software;
- There is a need for clarifications, not for fundamental change;
- Optimization is still an issue;
- Validation of ERs.

3.5   *PRIMAR – Official ENC Service* (re: doc. ENCUPD/3D), by Mr Robert SANDVIK, PRIMAR, Stavanger, Norway.

Mr SANDVIK outlined the scope of official ENC data products and ENC updating services that will be provided by PRIMAR, from 1 July 1999. Various encryption methods, digital signatures, and other types of security schemes were also discussed.

3.6   *Temporary and Preliminary Notice to Mariners and the ENC* (re: doc. ENCUPD/4A), by Mr Barrie GREENSLADE, UK HO, Taunton, UK.

Mr GREENSLADE discussed some of the pros and cons of different methods for disseminating temporary and preliminary NtM with ENC updates. Four methods were outlined:

1) Word processor text format file, independent of the S-57 data;
2) Caution Area (S-57 object CTNARE) using attribute TXTDSC pointing to the independent text file;
3) Encoding objects in ER files;
4) Combination of the above three methods.

 The UKHO has decided to adopt Method 2.

3.7   *Canadian S-57 Updating Experience* (re: doc. ENCUPD/3E), by Mr Joel BOX, NDI, St. John's, Newfoundland, Canada.

Mr BOX discussed the current means and processes to achieve IMO-compliant ENC updating in Canadian waters, as NDI is in charge of distributing CHS' ENCs and updates. Initial ENC updating service started in April 1997. Updates are currently posted on NDI server (i.e., via Internet). Currently, there are 13 registered users and 264 S-57 ENCs with 55 updates are available. NDI has conducted Update Server tests and sea-trials. In ENC update messages, only "delete" and "insert" S-57 commands are currently used, but not "modify". For all ENC updates, CHS conducts a verification, whereas NDI performs the validation. NDI is working to establish a dealer network. Mr BOX explained the current ENC updating infrastructure between CHS, NDI, dealers and end-users. NDI is also looking into encryption and pricing issues. ENCs, including their updates, are currently priced at $80 (Canada) per ENC per year. Ultimately, NDI want to achieve fully-automatic ENC updating (i.e., "Control U" on keyboard). The NDI web-site can be consulted at: http://www.ndi.nf.ca, for further information.

3.8   *Experience and Some Comments on ENC Updating* (re: doc. ENCUPD/3F), by Mr Andrey VOROBIEV, Transas Marine, St. Petersburg, Russia.

Mr VOROBIEV discussed Transas' experiences in terms of performing ENC updates on Transas Marine 2400 ECDIS. Two main problems have been identified:

1) The quality of ENC data and updates, from HOs, is variable; and
2) Some processes, listed in S-52 Appendix 1, are really not necessary or easily achievable.

Transas' system has the ability to perform integrated and non-integrated (manual)

updates. S-57 commands "delete", "insert", and "modify" can also be performed on updates. Mr VOROBIEV suggested that a "move" command might be useful. He expressed concerns about ENC updates becoming encrypted. In his view, updates should be distributed by any possible means, for safety of navigation purposes.

3.9 *ENC Updating with Hydrographic Object Manager NT* (re: doc. ENCUPD/3G), by Mr Mike GOURLEY, Universal Systems Ltd., Fredericton, NB, Canada.

Mr GOURLEY discussed what is involved in generating a S-57 ER Exchange Set (ENC update information), using USL's Object Manager. He mentioned a non-commercial S-57/ENC Discussion Service, which is intended to be a forum for exchange of ideas on how to interpret IHO S-57 and apply it to the real world (references are www.listbot.com and S57@listbot.com). It was noted that the Open ECDIS Forum (www.openecdis.org), which is supported by the IHO, had been set up for a similar purpose.

3.10 *ECDIS Data Service* (re: doc. ENCUPD/4B), by Mr Max FUNCKE, BSH, Germany.

Mr Funcke presented a flow chart illustrating the coordinated production of Notices to Mariners and ENC Updates at the BSH, intended for PRIMAR and the BAFEGIS Project (German-Swedish ECDIS trials).

(The workshop then divided into three smaller working groups to consider specific aspects.)

4. PRODUCTION OF ENC UPDATES

This issue was addressed by a Sub-Working Group chaired by Dr. Christopher DRINKWATER (UK). The Sub-WG was assigned 9 topics related to the production of ENC updates.

4.1 Production and quality control of update messages. Consistency of dataset contents.

- PRIMAR reported that many of the error messages produced by commercial QA/QC software were the result of incorrect interpretations of the ENC Product Specification. However, good progress has been made, together with the software companies, in removing these false error messages.

- There is a need for an IHO-endorsed list of QC/QA checks on ENC data (e.g., look at what PRIMAR, Transas, Australian HO use, and then combine). An initial list was compiled by Transas Marine and is contained in doc. ENCUPD/7.3A).

4.2 New updating requirements arising from HOs producing ENCs from source data as opposed to paper charts

- No new fundamental requirements were identified.

4.3 ENC Updating: Morintech Proposal

- The Morintech proposal for generating and managing NtMs was very interesting and the IHO Updating Working Group, if re-established, may wish to review it. However, any changes to HOs updating practices should be based on user needs and demands, not individual technical solutions.

4.4   Cell cancellation message

- Clarification is required in S-57 ENC Product Specification (S-57 Appendix 1).

4.5   Errors in ER data

- The errors in the data sets identified by Mr Peiponnen's paper (e.g. update outside cell, coding errors, or discrepancy in Data Set Identification field) were true errors and not the result of misinterpretations of the ENC Product Specification. As such, the data was invalid. It was pointed out, however, that the data in question was early test data; "real" ENCs will not contain such errors.

4.6   Display of updates by the mariner

- The display of updates by the mariner in order to review their contents is an IMO PS requirement.

4.7   "Modify" command (should it be mandatory?)

- This S-57 command is more efficient than "add" or "delete" in certain circumstances but it was not agreed that its use should be made mandatory.

5. DISSEMINATION OF ENC UPDATES

This issue was addressed by a Sub-Working Group chaired by Dr. Lee ALEXANDER (USA). The Sub-WG was assigned 12 topics related to the dissemination of ENC updates. In order to facilitate the discussion of these topics, the Sub-WG Chairman assigned the topics to one of four topic groups.

5.1   Topic Group 1 – ENC Update Security Scheme

- Encryption mechanism for update messages. Impact on data corruption and piracy.
- Harmonization of encryption processes.
- Safeguards against tampering.

Discussion: Both ENCs and updates will likely be encrypted (e.g. PRIMAR). Two key reasons are to protect investment (producers) and ensure data integrity/security (users). However, at this time it is premature to decide on means/process.

Recommendation: Wait to see results of PRIMAR trials.

<u>Issues to consider</u>:

- Should ENC decryption occur inside or outside the ECDIS?
- Is there a mandate to encrypt ENCs or updates? Is it optional?
- The first generation of type-approved ECDIS (i.e., in accordance with IEC 61174) will not have encrypted ENCs.
- Is there a need for IHO to become involved in setting standards for ENC encryption?

5.2   Topic Group 2 – <u>Type of ENC Updating Service</u>

- Type of update service that HOs intend to provide, including packaging and distribution media options. RENC's role through all the process of updating.

- Assessment of proposed ways of dissemination of updates, their impact on ENC pricing and their relationship to ENC security schemes.

- Mechanism of charging customers of ENC updates.

- Internet-based updating.

<u>Discussion</u>:   Different countries have various means/process for ENC updating.

- Canada – CHS issues ENC updates, and NDI is the official distributor. Commercial agents will also be involved. Currently an "on-demand" internet-based service (e.g., TCP/IP) is in place. They are looking at different models. Pricing scheme is as follows: registration fee – no cost; ENC data - $80 (Canada) per ENC per year; updating – no cost for first year.

- PRIMAR (European RENC) – Twelve HOs participate. PRIMAR is the official ENC service provider. ENCs and weekly updates are provided via CD-ROM. A "push-based" service is planned. Pricing scheme is as follows: registration fee – no cost; ENC cells – to be determined; updates – to be determined.

- USA-NIMA – They will issue DNCs by CD-ROM. They expect to work out suitable means for updating in the near future. They do not plan to compete with the private sector, but will look into the use of "value-added" dealers.

- USA-NOAA – ENC data is issued with raster data on CD-ROMs. Data is distributed by MapTech, a commercial company. Pricing is as follows: registration fee: $15 plus $35 handling; ENC data - $4 (USA) per ENC; updates - $15 (USA) per ENC per year.

- Japan – Currently, ENC data is available on 8 CD-ROMs. Updates are provided via monthly ERs. No internet based service is available yet. Pricing scheme is as follows: registration fee – no cost; ENC data – 50-100K Yen per CD; updates –

2400 Yen per CD per year.

- Singapore – 15 Cells of ENC data are available on a single CD-ROM. Updates are based on NtM. Pricing is as follows: registration fee: $80 (Singapore); ENC data – no charge; updates – free for first year, $60 (Singapore) per year afterwards.

Recommendation: IHO should only inform (not specify) what various HOs are doing, and/or what could be done.

5.3   Topic Group 3 – Coordination of ENC Updates and Notices-to-Mariners

- Coordination of updates / new editions for ENCs and paper charts.
- Automatic updates.
- Structure of official updating database (for on-demand service).
- Update by independent text file.

Discussion: This should be a goal, not a requirement. Synchronization is not always possible. Benefits of timely, frequent and/or automatic updates will eventually be viewed by ECDIS users as a major benefit (e.g., compared to paper charts).

Recommendation: If convened, the IHO Updating WG should provide recommendations/guidance on this matter.

5.4   Topic Group 4 – Need to Revise IHO S-52, Appendix 1

- Future of IHO S-52, App 1 (revision, policy vs. technical focus).

Discussion: Many felt that S-52, Appendix 1 is really a "flea market." It could be revised (i.e., a new draft) to reflect the experience of the private sector (manufacturers and users). RAdm GUY stated that it is not the intent of IHO CHRIS to make changes at this time and will wait for more experience to be gained first. However, IHO CHRIS will look into re-establishing an Updating WG. Initial work may be accomplished based on the successful approach taken by IHO Technology Assessment WG (communications would be done via e-mail).

Recommendation: If convened, the IHO Updating WG should be given clear guidance (e.g. Terms of Reference) by CHRIS regarding the purpose and scope of an IHO Publication dealing with ENC Updating "Guidance" and/or Specifications. The views and experiences of the private sector should be taken into consideration.

6. IMPLEMENTATION OF ENC UPDATES

This issue was addressed by a Sub-Working Group chaired by RADM GUY. The Sub-WG was assigned 3 topics related to the implementation of ENC updates.

6.1   Legal Status of digital updates from a SOLAS perspective

- They have the same legal status as the NtM issued for use with paper charts.
- If a Mariner is aware that an ENC update exists and was not applied to the ECDIS, the operational status of the ECDIS is therefore affected and there may be legal implications.

6.2   Impact of data encryption on interoperability of the update message and various types of ECDIS

- This could have legal implications.

6.3   Non-uniformity of ENC encryption processes

- This may have legal implications in terms of the dissemination of ENC information.

(The Workshop then reconvened in plenary, where reports were given by the Sub-WG Chairmen.)

7. CONCLUSIONS

As a result, the Workshop identified a <u>list of required actions</u>, as follows:

7.1   Produce a combined list of ENC QC/QA checks to be performed

Action: PRIMAR & IHB

7.2   Clarify S-57/ENC Product Specification in regard to cell cancellation message.

Action: TSMAD

7.3   Advise IHO Member States of the pricing structure of other Member States. Develop a "matrix approach" of the different means and processes currently used by HOs and RENCs for ENC/update pricing and services.

Action: IHB

7.4   Consider the re-establishment of an IHO Updating WG to consider among other issues:

a. The structure of an "Updating Data Base"
b. Amendments to S-52 Appendix 1. The main driving force for any changes should be user requirements (both NtM producers and NtM users), not the capabilities

of S-57.

Action: CHRIS and IHB

7.5   Advise Member States to co-ordinate their updating procedures with the paper chart providers.

Action: IHB

7.6   Advise Member States of the benefits of "automatic updates".

Action: IHB

7.7   Promote the use of the Open ECDIS Forum (OEF) as a vehicle for Working Group and Committee activities.

Action: IHB

8. CLOSURE OF THE WORKSHOP

The Chairman noted that the actions identified above would have to be undertaken as soon as feasible. There being no further issues to address, he closed the Workshop at 14:00 on 4 May.

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IHO WORKSHOP ON ENC UPDATING
Mobile, Alabama, USA, 3-4 May 1999

LIST OF DOCUMENTS

ENCUPD/1A rev.3	List of Documents
ENCUPD/1B rev.3	List of Participants
ENCUPD/2A rev.2	Abridged Agenda
ENCUPD/3A	Electronic Notices to Mariners and International Data Exchange, by Mr. Andrey V. SABAJDASH, Hydro-Service AS, Norway
ENCUPD/3B	Manufacturer feedback topics to be discussed, by Mr. Hannu PEIPONEN, Aspo, Finland
ENCUPD/3B add.1	Comments on Mr. Hannu PEIPONEN's paper (ENCUPD/3B), by Mr. Ismo LAITAKARI, Finnish Maritime Administration
ENCUPD/3C	Technical Issues in Supporting Incremental Update Generation for ENC, by Mr. Peter WOODSFORD, Lase Scan, UK
ENCUPD/3D	PRIMAR - Official ENC Service, by Mr. Robert SANDVIK, PRIMAR, Norway
ENCUPD/3E	Canadian S-57 Updating Experience, by Mr. Joel BOX, NDI, Canada
ENCUPD/3F	Experience and Some Comments on ENC Updating, by Mr. Andrey VOROBIEV, Transas Marine, Russia
ENDUPD/3G	ENC Updating with Hydrographic Object Manager NT, by Mr. Mike GOURLEY, USL, Canada
ENCUPD/4A	Temporary and Preliminary Notice to Mariners and the ENC, by Mr. Barrie GREENSLADE, UKHO
ENCUPD/4B	ECDIS Data Service, by Mr. Max FUNCKE, BSH, Germany
ENCUPD/4.1A	DNC Database and VPF Database Update (VDU), by Cdr Mike O'LOUGHLIN, NIMA, USA
ENCUPD/7.3A	S-57 Data Conformity, by Mr. Andrey VOROBIEV, Transas Marine, Russia

Note: Document numbers, e.g. 3 for doc. ENCUPD/3B, refer to the corresponding agenda items in the Abridged Agenda (doc. ENCUPD/2A), i.e. agenda item No. 3 in the above case.

IHO WORKSHOP ON ENC UPDATING
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IHO WORKSHOP ON ENC UPDATING
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ABRIDGED AGENDA

1. Opening and administrative arrangements.

2. Approval of the Agenda.

3. Presentations by commercial firms invited to report on their experience of ENC updating.

4. Future ENC updating procedures, as compared to the paper chart regime.

    4.1. NIMA plans for Updating of the Digital Nautical Chart

5. Appointment of technical sub-working groups.

6. Report back of sub-working groups.

7. Production of ENC updates.

    7.1. How the ENC Product Specification deals with updates at a functional level.
    7.2. Requirements of S-52 Appendix 1 and their current relevance and validity.
    7.3. Production and quality control of update messages. Consistency of dataset contents.
    7.4. New updating requirements arising from HOs producing ENCs from source data as opposed to paper charts.

8. Dissemination of ENC updates.

    8.1. Type of update service that HOs intend to provide, including packaging and distribution media options. RENC's role through all the process of updating.
    8.2. Coordination of updates / new editions for ENCs and paper charts.
    8.3. Assessment of proposed ways of dissemination of updates, their impact on ENC pricing and their relationship to ENC security schemes.
    8.4. Encryption mechanism for update messages. Impact on data corruption and piracy.
    8.5. Mechanism of charging customers of ENC updates.

9. Implementation of ENC updates.

    9.1. Legal status of digital updates from a SOLAS perspective.
    9.2. Impact of data encryption on interoperability of the update message and various types of ECDIS.

10.   Conclusions.

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