INTERNATIONAL HYDROGRAPHIC ORGANIZATION

ORGANISATION HYDROGRAPHIQUE INTERNATIONALE

ENC UPDATING WORKING GROUP (EUWG)

[A Working Group of the Hydrographic Services and Standards Committee - HSSC]

Chairman: Yves Le Franc (SHOM)
Vice-Chairman: Richard Coombes (UKHO)

EUWG Letter 01/2010

Date 13 January 2010

To EUWG Members

Dear Colleagues,

First of all, I'm pleased to inform you that Stig Osaland joins the group as PRIMAR representative.
Now, it is time to launch our work according to the new TOR.
Valid comments have been received on these from AU and PT following on from the EUWG letter 06/2009. Slightly modified TOR could be submitted to HSSC2 if our WG still exists after this meeting. In fact, it is not certain that HSSC will maintain the EUWG if the group achieves its objectives. The modified TOR, rules for chairmanship, could be in line with most current practices noting that EUWG's rules have been defined by HSSC according to TOR of HSSC (§1.9). Regarding the liaison with other WGs, you can be sure that we will liaise with all other WG or body as necessary.

EUWG is tasked to review and update S-52 Appendix 1, "Guidance on updating the ENC", for subsequent inclusion in S-65 and report to HSSC2 (2010 summer). Ideally and, if feasible, S-52 Appendix 1 should be removed after our work is completed. S-65, "ENC Production Guidance", is designed to inform ENC producing HOs of best practice. So, a first task for us will be to identify those items of S-52 Appendix 1 that are relevant to this objective.

Before these agreed items are transferred to S-65, they should first be updated. Perhaps further advice to ENC producers should be provided in the S-65, "Maintain ENCs" section. This additional advice could be supplied by EUWG members together with feedback from various stakeholders. It occurs to me that the RENCs are in a good position to provide us with some useful feedback given their relationships with OEMs and end-users.

For the others parts of S-52 Appendix 1 which are not relevant for inclusion in S-65, we could check to see if these items are already included in other documentation. If not there may be other documents where there inclusion would be more appropriate. This could

result in the removal of S-52 Appendix 1 altogether, noting that documents referring to S-52 Appendix 1 should be carefully identified.

Following on from our previous work (see EUWG report to HSSC1 and HSSC1 minutes), a specific point to be addressed with WWNWS (at least) is the review of the status of RNW in respect of ECDIS and provide recommendations.

Please, let me know if you agree with this overview of our work plan and let me know your suggestions.

There is no doubt that we can start to work on the improvement of S-65 for ENC updating. In this respect I have highlighted in blue the items in S-52 Appendix 1 which seem to be relevant to S-65 (see Annex A). Within these items there are § 1.2.1 and Annex A. Annex A should be replaced by S-4, section B600 "Chart Maintenance", currently under final review by CSPCWG (see Annex B). This section has application in detail to paper charts but the general principles apply equally to paper and electronic charts.

EUWG members are therefore requested to comment on the draft identification of S-65 relevant items in S-52 Appendix 1 and to examine section B600 of S-4 to see if supplementary advice is necessary.

It is important that we obtain as much feedback as possible from the various stakeholders. **Members are invited to express any need for improvement on the subject of ENC maintenance/updating as practiced by producer HOs with, if possible, proposals and recommendations.** Perhaps there are some subjects around the maximum number of ERs for an ENC, the maximum size of an ER, whether to issue an ER, reissue and EN, etc. etc..

Please send your replies **before 19 February 2010.**

Rounds will follow to compare answers and to provide improvements to S-65.

Yours sincerely,

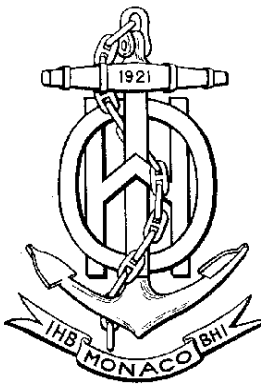
Yves Le Franc,
Chairman

Annex A: S-52 Appendix 1 with draft identification of relevant items

Annex B: S-4 B600 – Last draft version - CSPCWG 6-09.1B

Annex A to letter EUWG 01/2010

INTERNATIONAL HYDROGRAPHIC ORGANIZATION



GUIDANCE ON UPDATING THE ELECTRONIC NAVIGATIONAL CHART

3rd Edition, December 1996

Special Publication No. 52
APPENDIX 1

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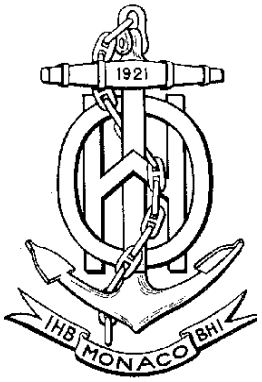

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1 INTRODUCTION

1.1 Background and References

1.1.1 Background

This publication, Guidance on Updating the Electronic Navigational Chart (ENC), was developed by the Updating Working Group (UWG) of the IHO Committee On Hydrographic Requirements for Information Systems (CHRIS). There has been considerable progress in technology, knowledge and practical experience with ECDIS since the UWG was first constituted. The scope, aims and assumptions upon which this latest work is based are reviewed below.

1.1.2 References

Care has been taken to be consistent with and be guided by the contents of relevant reports with particular recognition being given to the latest edition of:

.1 IMO Performance Standards for ECDIS, Assembly Resolution A.817 (19)
.2 IHO Publication S-52 "Specifications for Chart Content and Display Aspects of ECDIS" with:
Appendix 2 - "Colour & Symbol Specifications for ECDIS"
Appendix 3 - "Glossary of ECDIS - related Terms".
.3 IHO Publication S-57 "IHO Transfer Standard for Digital Hydrographic Data".
.4 IHO CL 27/1994, Encl., "Worldwide Electronic Navigational Chart Data Base (WEND), Report of Activities of the Special Committee, 1994".

[Yves Le F1]

1.1.3 Terminology

Terminology used in this report is consistent with S-52 Appendix 3, "Glossary of ECDIS-related Terms". Additions and amplifications are described in Section 2 and Annex A.

1.1.4 Sea Trials

Various aspects of ECDIS have been evaluated and tested during the past few years. Project reports of these practical and, in most cases, at-sea experiences, have also been considered in this report. In particular:

.1 Canadian ECDIS Testbed Project
.2 The North Sea Project ("The North Sea Project - Final Report", Norwegian Hydrographic Service, 1989).
.3 The Seatrans Project ("The Seatrans Project", Norwegian Hydrographic Service, 1991).
.4 "Hamburg Ferry" ECDIS Testbed, Germany (1991).
.5 The Netherlands ECDIS Project ("Report of ECDIS Sea Trials", Netherlands Hydrographic Service, 1991).
.6 US ECDIS Test and Evaluation Program.
.7 BANET Trial, Germany, UK, Finland (1993-95)
.8 US Coast Guard Field Trial on Manual Updating (1996)

1.1.5 WEND Committee

The IHO Special Committee on a Worldwide Electronic Navigational Chart Data Base (WEND) has agreed on the following definition of WEND:

1. *The Worldwide Electronic Navigational Chart Database (WEND) System is a common, worldwide network of ENC datasets, based on IHO standards, designed specifically to meet the needs of international maritime traffic using ECDIS which conform to the IMO Performance Standards.*

2. *The System will utilize HO national ENC datasets, which are integrated and may be distributed and updated through regional centres.*

3. *WEND represents an IHO System based on the cooperation of participating Member States.*

   A Regional Centre under the WEND concept is designated a Regional ENC Coordinating Centre (RENC). This Guidance on Updating the ENC addresses the updating support recommended to be provided by the RENC.

A number of principles adopted at the WEND meeting have a direct bearing on ENC updating:

1 Ownership and Responsibility

a) A Member State has responsibility for preparation and provision of digital data and its subsequent updating for waters of national jurisdiction.

b) A Member State responsible for originating the data should validate it.

f) Legal liability must be recognized by participants.

2 Cooperation and Coordination

e) Neighbouring Member States are encouraged to cooperate in boundary areas.

4 Standards and Quality Management

a) A recognized standard of quality management (e.g., ISO 9000) should be employed to ensure a high quality of the ENC services.

b) There should be compliance with all relevant IHO and IMO standards and criteria.

5 Distribution

a) Distribution of products may be separate from the data base management.

b) Methods to be adopted should ensure that data bear a stamp or seal of approval of the issuing HO.

6 Updating

a) Technically and economically effective solutions for updating should be established.

b) National HO's providing source data are responsible for advising the issuing HO of update information in a timely manner.

c) The issuing HO is responsible for providing timely updates to the ENC for the mariner.

d) Updating information to regional or greater area ENC datasets should be available world-wide.

[Yves Le F2]

The conceptual model agreed by the WEND Committee for the operation of an RENC is at Figure 1, with updating segments emphasized.

1.2 Scope and Objectives

The basic objective of this publication is the facilitation of the development of technically and economically feasible solutions for updating the ENC within a shipboard ECDIS to support safe and efficient navigation that:

.1 are efficient, effective, applicable world wide and easily verifiable, and
.2 maximize the speed, accuracy and reliability advantages of digital data transfer.

Specifically, this publication sets forth the guidance for the updating service and the ECDIS to support the updating of the official navigational data base specified by IMO Assembly Resolution A.817 (19), defined by IHO publications S-52 and S-57, and issued through an RENC. Some requirements may be satisfied by one of a variety of service options.

1.2.1 Updating of paper charts

The existing process for updating the paper chart is described at Annex B. Safety of navigation dictates that many of the processes described will need to have their counterpart in any update process for the ENC[Yves Le F3].

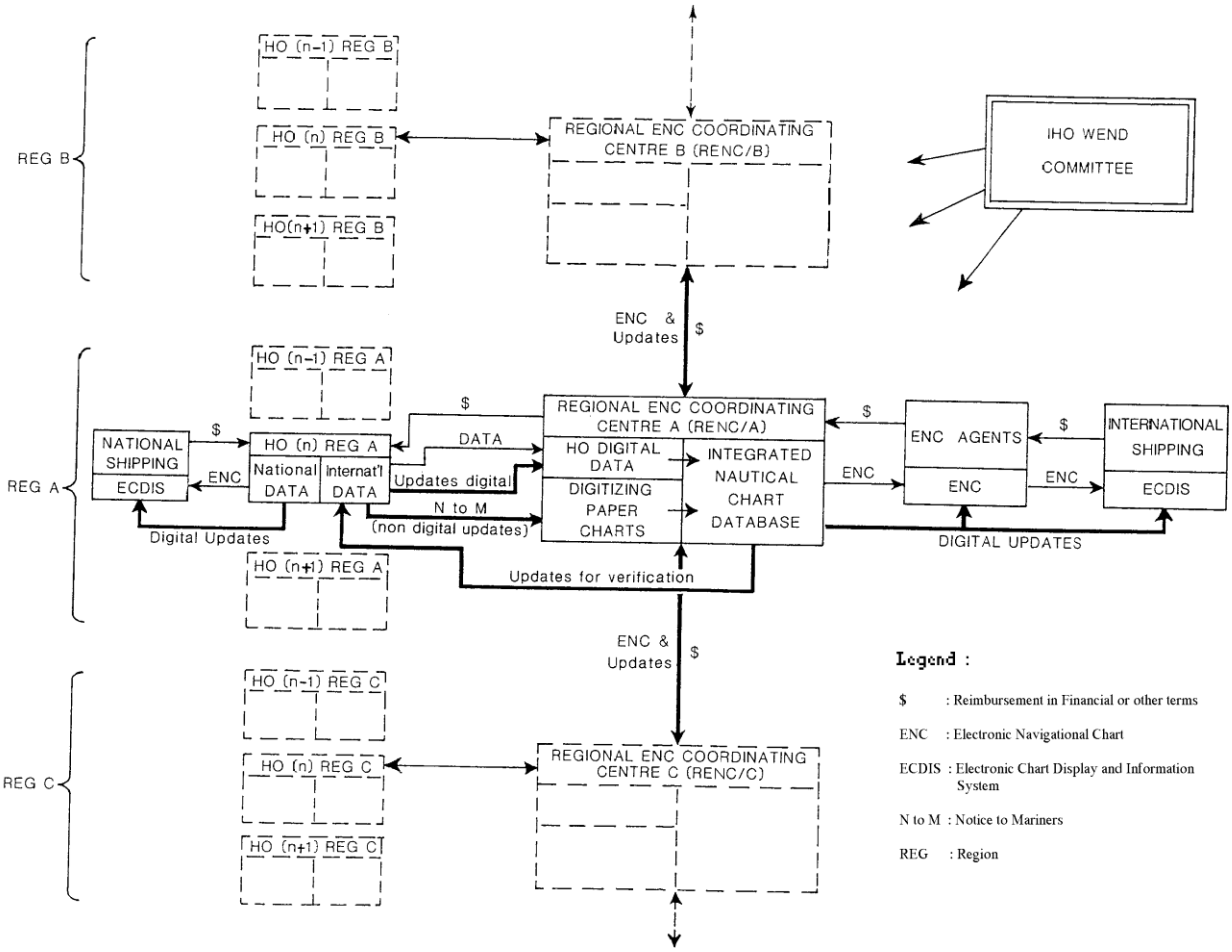
1.2.2 Volume of updates

An estimate of the anticipated volume of data required to update a worldwide set of ENCs is given in Annex C. The update mechanism described in S-57 should facilitate efficient updating by electronic means based on the estimated data volume given in Annex C.
[Yves Le F4]

1.2.3 Electronic Chart Systems

Electronic Chart Systems (ECS), which are not the equivalent of the conventional nautical (paper) chart, are not considered here.

Fig. 1 - Conceptual Model of a Regionally Integrated Database Service



(From the Report of the Special Committee on WEND, 1994)

2 MODEL OF UPDATING

2.1 Introduction

In this section, updating the Electronic Navigational Chart is considered an application process involving several real systems. The analysis which follows is concerned with the information exchange between the various entities involved with updating. No attempt is made, however, to describe internal functions within a participating system, such as the access to an update information file, or details of check procedures.

The **scope of the model** is:

.1 To define the possible transfer types capable of transferring the ENC update information for ECDIS,

.2 To identify any interfaces at the end systems and within the updating for each possible transfer type,

.3 To define the services required at the interfaces, and which of them need specification.

2.2 Terminology

(a) **ENC Update Information** encompasses the information necessary at a certain moment to render an ENC current and correct as required.

(b) **ENC Updating** is the process of producing, disseminating and incorporating the ENC update information in an ECDIS. To accomplish an update of an ENC, updates are applied to the SENC. Issuing a new edition of the ENC, and the reissuing of a version of the current edition ENC which incorporates all changes which have been disseminated as ENC Updates up to a specific date (the equivalent of a "corrected reprint" paper chart), although logically the most comprehensive update operations, are not treated here. ENC Updating involves:

.1 **Entities** engaged in processing the ENC update information;

.2 **Physical Media** used to carry the update information;

.3 **Update Operations**, chosen by the issuer of the update information and subject to his responsibility, to provide the update information to the SENC in the most efficient way;

.4 **Transfer Procedures** of update information, depending on the media and channels used as well as validation procedures required to secure correctness;

.5 **Data Base Operations** for incorporating the update information and verifying the updated data base.

2.3 Updating Entities

(a) The following entities are involved in updating (see Fig. 2):

.1 **Source Provider**: an originator, such as an originating HO, or another information source, such as a local authority, providing navigational warnings.

.2 **Issuing Authority**: an entity assembling an ENC update data set from update information provided from various sources, and being responsible for setting up the transfer of the update set. By definition, the Issuing Authority is the issuer of the ENC to which the update applies. The Issuing Authority under the WEND system is the Regional ENC Coordinating Centre (RENC).

.3 **Distributor**: an entity responsible for packaging, repackaging, and/or disseminating an update set to all users, or a group of users.

.4 **Receiver**: usually the mariner on board ship, or the telecom receiver linked to the ECDIS.

.5 **Applier**: an entity controlling the application of the update information, e.g. the mariner keying in update information, or the software inside ECDIS automatically processing the ENC update information.

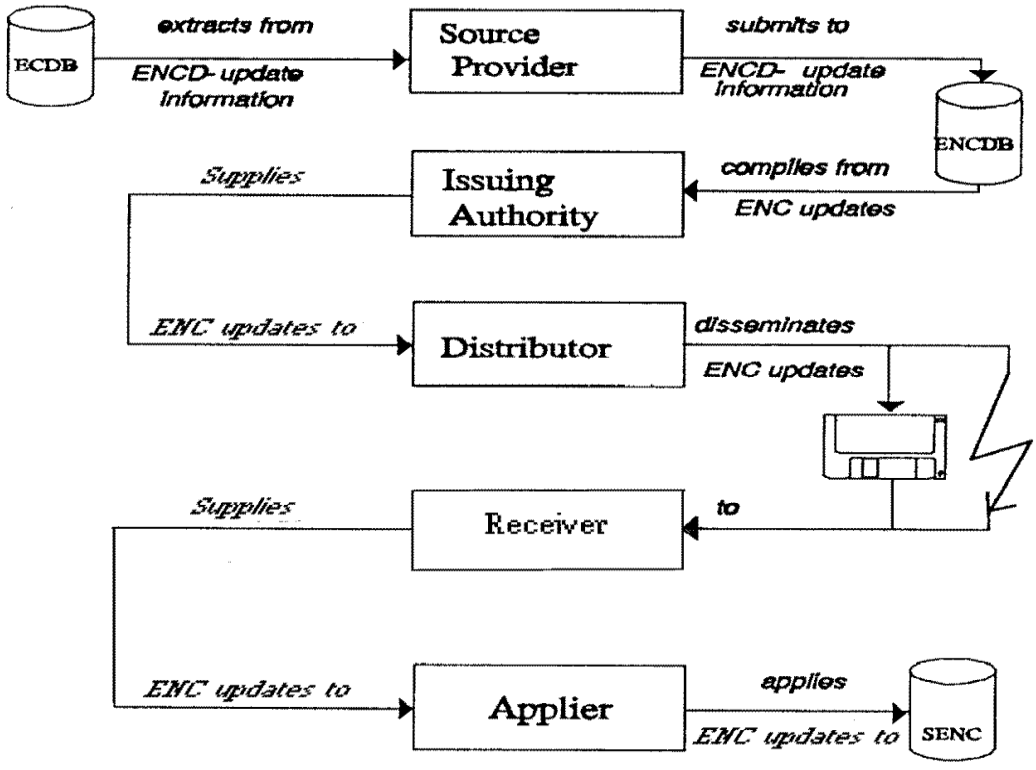
.6 **SENC**: the ECDIS data base to be ultimately updated, and actually being used for data access.

(b) **Source Provider** and **SENC** are the **primary entities** as they represent origin and target of the updating process. They must always be present. The other entities are called **transit entities** as they perform intermediary functions which are not required for all transfer media.

(c) Entities that actually participate in the updating depend on the media used for transferring the update information. For example, a direct link (e.g. via telephone) between a receiving ECDIS and an RENC does not involve an intermediate distributor.

(d) Entities do not necessarily have to be considered as organizationally distinct. Depending on the organizational concept adopted for updating, two or more entities (e.g. source provider and issuing authority, or issuing authority and distributor) may be coincident. The particulars of the organizational concept are beyond the scope of this Guidance.

Fig. 2 - Overview of Update Information Flow



Legend : ECDB : Electronic Chart Data Base

ENC : Electronic Navigational Chart

ENCD : Electronic Navigational Chart Data

ENCDB : Electronic Navigational Chart Data Base

SENC : System Electronic Navigational Chart

2.4 Service Categories

(a) **Scheduled Service**. An updating service at regular intervals known in advance by both the sender and receiver. The dates of transmission can be those agreed upon in a bilateral contract between e.g., distributor and receiver, or a broadcast or mailing schedule of the distributor published in an official publication. There may be customized service modes, such as expedited transfer or direct on-line transfer, which still are considered scheduled as long as they follow a previously agreed schedule.

(b) **On-demand Service**. Any updating service at the expressed request of an individual user, e.g. transmission of updates called up by the user in a dial-up session with an official updating data base (another example is the request for retransmission of a missing Update Set). All update supply actions initiated by the user are regarded "on demand" unless the supplier itself relies on strict observation of a previously agreed schedule (and issues a "nil-message" if no updates are available).

(c) **Extraordinary Service**. Any updating transmission not following a regular schedule, and not individually requested by the user, such as an extraordinary navigational warning containing urgent ENC-related information.

2.5 Updating Categories

The updating methods can be subdivided into different categories:

2.5.1 Application Categories

(a) **Manual Updating** consists of a human operator entering information manually into the ECDIS, usually based on unformatted update information that is not machine-readable (such as printed NtMs, voice radio, verbal communication etc.). However, in order for the ECDIS to accept manual updates, the update information must be entered in a structured way at least compatible with the relevant ECDIS standards.

(b) **Automatic Updating** consists of an updating process by which the updating information is applied, within the ECDIS, to the SENC without operator intervention. All automatic updating requires the data to be formatted according to the relevant ECDIS standards. Automatic updating can be broken down into the following two sub-classes:

.1 **Fully-automatic Updating** is an updating method where the update data reaches the ECDIS directly from the distributor without any human intervention. This may be accomplished through a broadcast transmission, INTERNET, etc. Following an acknowledgement or acceptance procedure, the ECDIS automatically processes the update to the SENC.

.2 **Semi-automatic Updating** is an updating method requiring human intervention to establish a link between the media used for transferring the update information and the ECDIS (e.g. inserting an updating diskette, or establishing a telephone communication link). Following an acknowledgement or acceptance procedure, the ECDIS automatically processes the update to the SENC.

Distinction between these two sub-classes will be made only when it is considered relevant. In all other cases the term "Automatic Updating" covers either sub-class.

2.5.2 Data Base-Related Categories

(a) **Integrated Updates** are those which alter (supersede) information contained in the previous SENC. The IMO PS calls for integrated updates as a minimum requirement.

(b) **Non-integrated Updates** (e.g. manual) are those that do not alter the official ENC contents of the SENC. As such, this form of update simply adds additional information to the SENC. However, it can be acted on by ECDIS software in the same manner as is the data from the ENC. This form of updating, the capability for which is also a minimum requirement of the IMO PS, should be used only when Automatic Updating cannot be effected in a timely manner (e.g., for transient, preliminary updates such as radio navigational warnings affecting chart information or local notices issued by port authorities).

2.5.3 Aggregation Categories

Updates shall be aggregated in at least one of the following categories:

(a) **Sequential Update**: The new correction information that is provided since the previous update set.

(b) **Cumulative Update:** The collection of all sequential correction information which has been issued since the last new edition of the ENC or since the last official update applied to the SENC.

(c) **Compilation Update:** The correction information which has been issued since the last new edition of the ENC or since the last official update applied to the SENC, compiled into a single, comprehensive ENC update. (Example: If a buoy has been relocated two or more times since the ENC Edition, only the last position, tailored to correct the position contained in the ENC Edition as issued, would be included. Thus, the application of a Compilation Update is to correct the effective ENC Edition at the time of its distribution to a user, which could be some months or years after the Editions initial distribution). Compilation update is implemented in S-57 by means of a re-issue of an ENC.

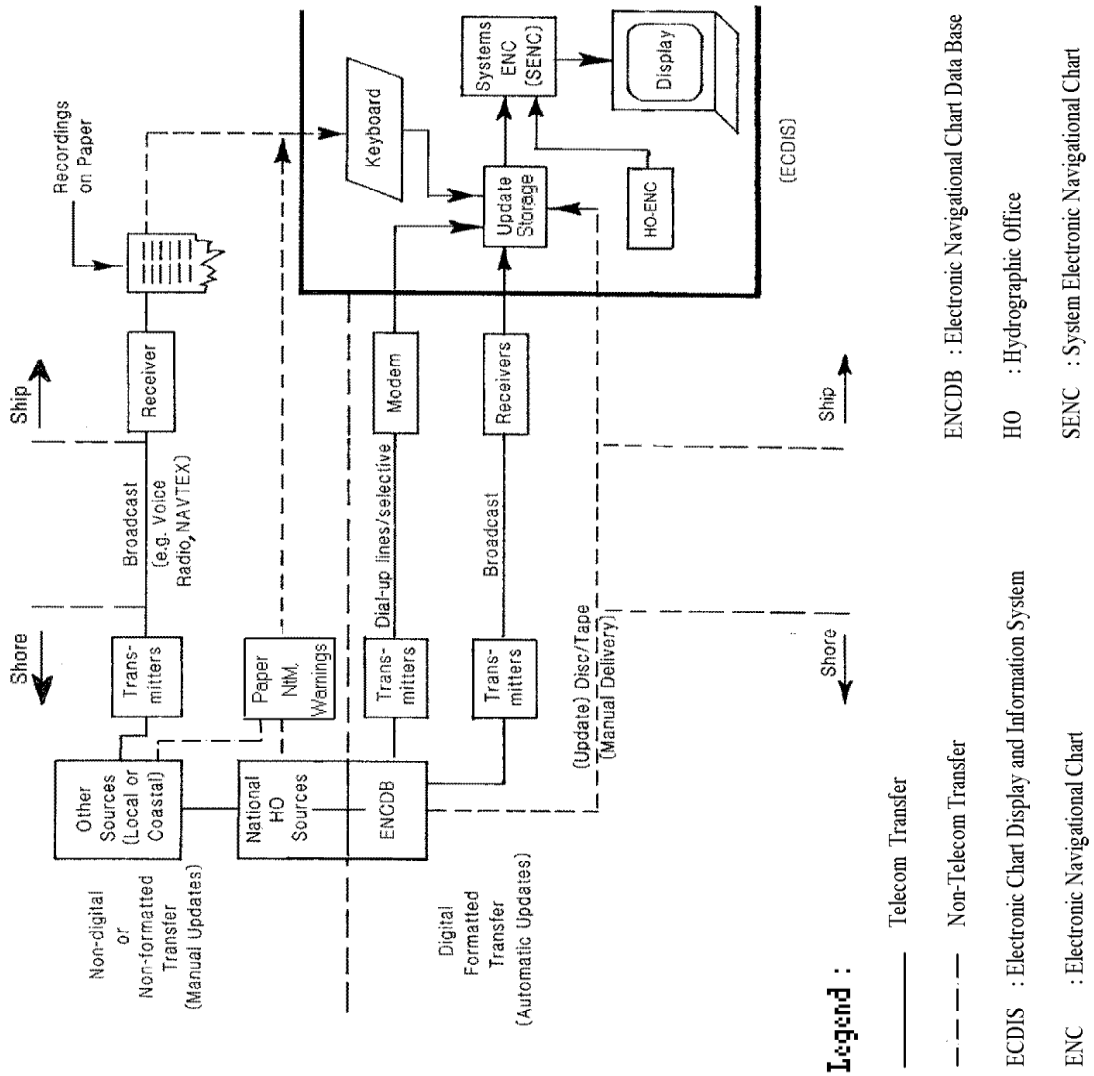
2.5.4 Formatting Categories

(a) **Unformatted Updating:** Any updating based on updating information provided in a format not complying with the IHO Standard or not being machine-readable.

(b) **Formatted Updating:** Updating based on machine-readable updating information provided in accordance with the IHO Standard.

2.5.5 Concepts of **Typical Information Flow**, **Application Flow** and **Delivery (At Sea) of Updates** are illustrated in Fig. 3, 4 and 5 respectively.

Fig. 3 - Typical Update Information Flow



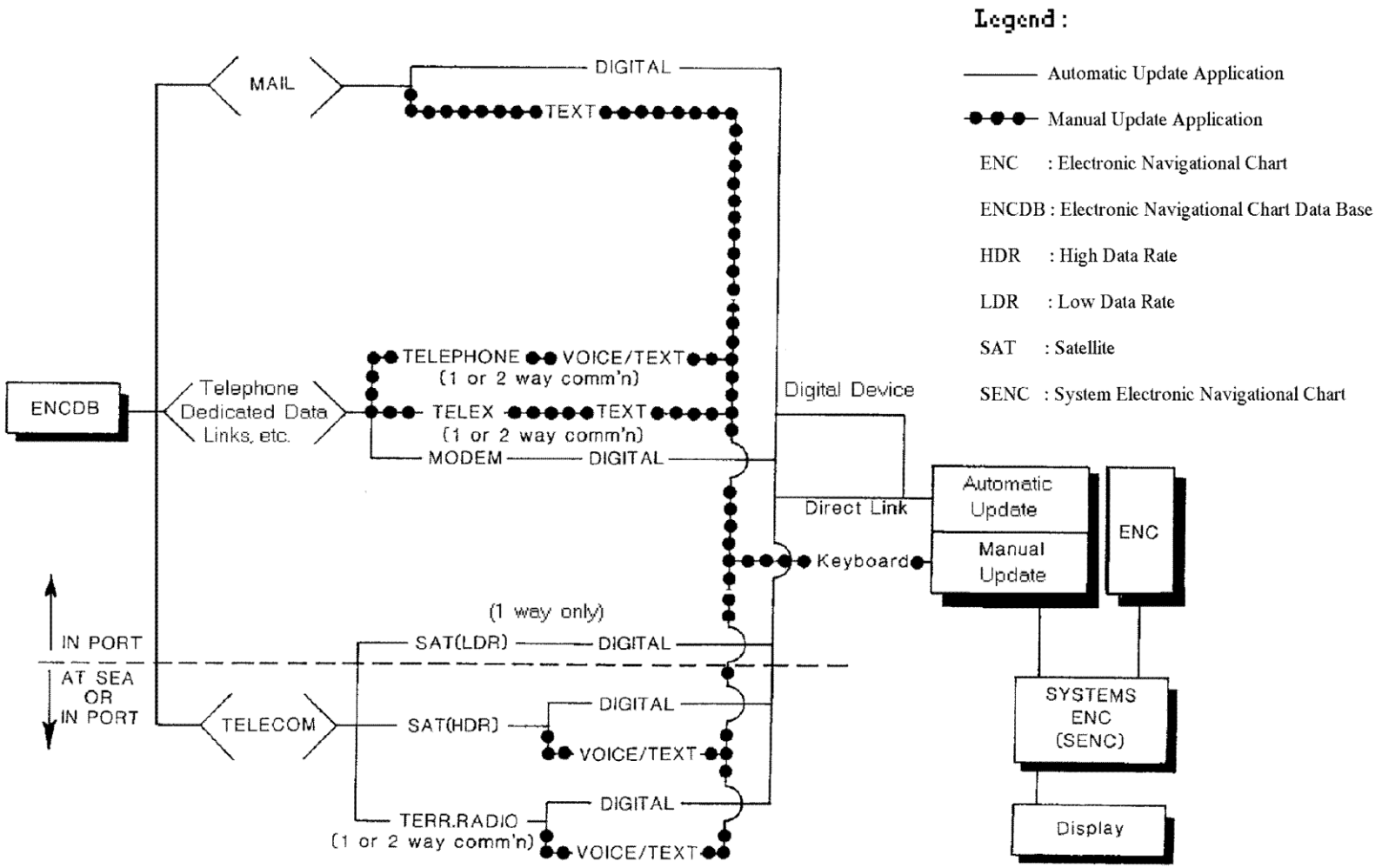
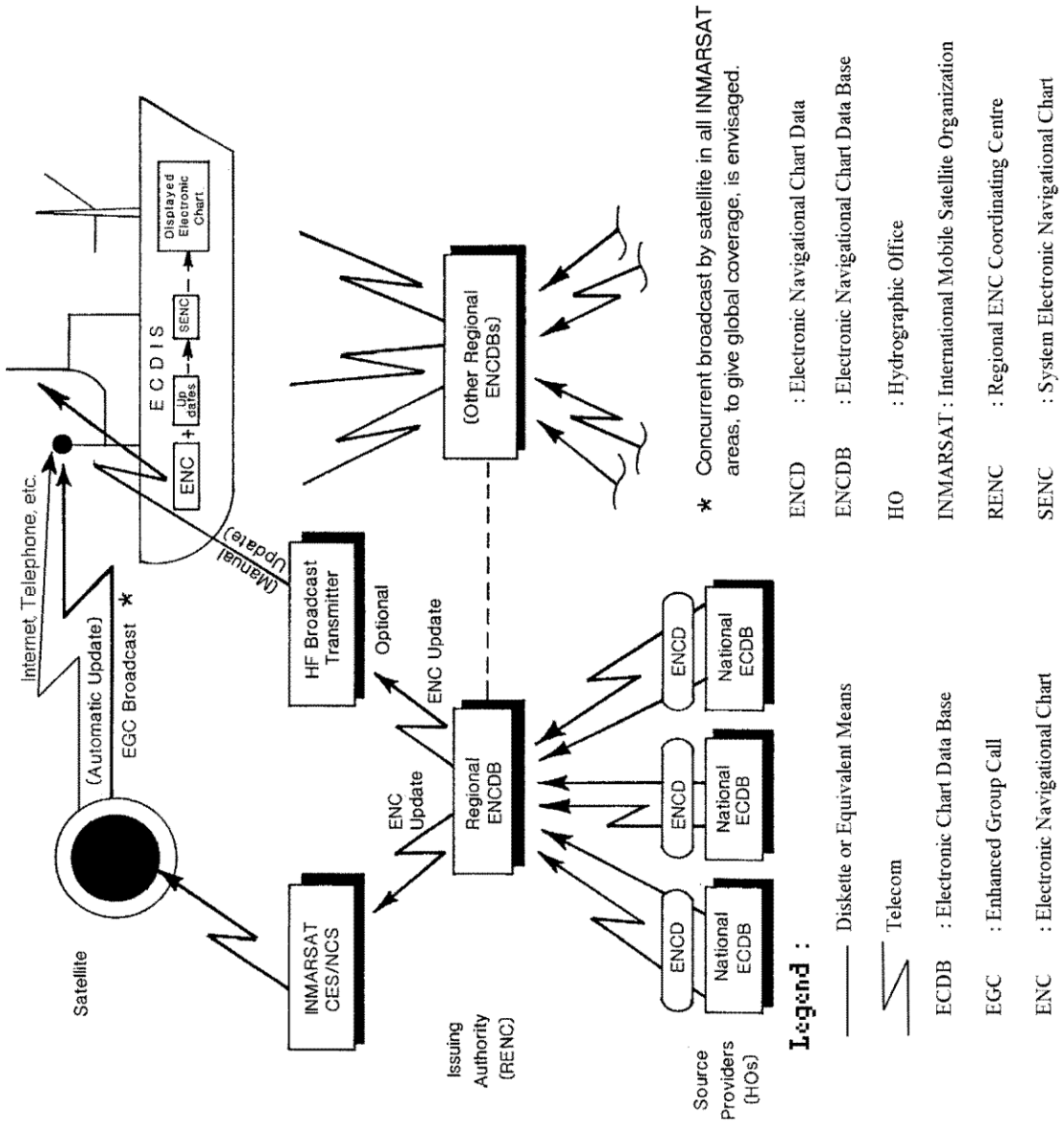

Legend :
Automatic Update Application
Manual Update Application
ENC : Electronic Navigational Chart
ENCDB : Electronic Navigational Chart Data Base
HDR : High Data Rate
LDR : Low Data Rate
SAT : Satellite
SENC : System Electronic Navigational Chart
MAIL
DIGITAL
TEXT
ENCDB
Telephone
Dedicated Data
Links, etc.
TELEPHONE
VOICE/TEXT
(1 or 2 way comm'n)
TELEX
TEXT
(1 or 2 way comm'n)
MODEM
DIGITAL
Digital Device
Direct Link
Automatic
Update
Manual
Update
ENC
Keyboard
(1 way only)
IN PORT
AT SEA
OR
IN PORT
SAT(LDR)
DIGITAL
TELECOM
SAT(HDR)
DIGITAL
VOICE/TEXT
TERR.RADIO
(1 or 2 way comm'n)
DIGITAL
VOICE/TEXT
SYSTEMS
ENC
(SENC)
Display

Fig. 5 - Typical Update Delivery (At Sea) Concept



3 SPECIFIC UPDATING GUIDANCE

An ENC may contain several cells for various areas and navigational purposes. However, for clarity in presenting Specific Updating Guidance, the ENC referred to in this section is an individual cell file based on the ENC Product Specification of S-57. An individual ENC cell fully complies with the ENC definition given in the Glossary of ECDIS-related Terms.

There are a number of ways the ENC data in the ECDIS SENC may be updated. Guidance is provided to define a minimum capability for the ECDIS on these methods, directed to:

.1 The Hydrographic Office (Source Provider) that originates the update information;
.2 The Issuing Authority responsible for the ENCDB, ENC, and ENC Update;
.3 The Distributor of the ENC Update;
.4 The Manufacturer of the ECDIS, and;
.5 The User (normally the mariner).

3.1 Source Provider (Hydrographic Office)

(a) **Provision of Update Information.** Hydrographic Offices which provide ENC Data (ENCD) to an Issuing Authority should take the same responsibility for updates as they do for the ENCD supplied. That is:

.1 the update information must be furnished in a manner such that the change it reflects can be distinguished by the Issuing Authority;
.2 the update information must accomodate all scales or navigational purposes, as appropriate, for which the ENCD was furnished.

(b) **Time Interval for Issuing of Updates**. According to accepted practice (Ref. IHO/IMO World-Wide Navigational Warning Service, Guidance Document, IHO Pub. S-53), the time interval from the initial broadcast of a Radio Navigational Warning to the issue of its corresponding Notice to Mariners should not exceed 42 days. All agencies involved in the preparation and distribution of ENC Updates should meet the same requirement. A considerable reduction in this time interval should be possible by taking advantage of existing digital and telecommunications technology.

(c) **Coordination of Boundary Area Updates.** Neighbouring HOs should coordinate the content and submission to the Issuing Authority of ENC Update information which impacts their boundary areas.

(d) **Quality Management**. HOs should establish appropriate quality management infrastructures for the production, management and distribution of ENC Update information.

(e) **Marine Safety Information (MSI).** Other information such as coastal radio warnings, local notices to mariners/notices to shipping, etc. provided to the mariner by other than hydrographic authorities may be relevant to ECDIS. While specific guidance to those providers for the purpose of manually updating the SENC is beyond the scope of this document, those providers should bear in mind that, with time, more mariners will be entering this information into their ECDIS. They should therefore endeavour to ease this task for the mariner by adding whatever additional information might be appropriate to facilitate manual input.

[Yves Le F5]

3.2 Issuing Authority (Regional ENC Coordinating Centre)

(a) **Responsibility for ENC Updates**. The Issuing Authority for an ENC is responsible for official updates for that ENC.

(b) **Quality Management**. Issuing Authorities should establish appropriate quality management infrastructures for the production, management and distribution of ENC Updates.

(c) **Distribution Network**. It is the responsibility of the Issuing Authority to establish a distribution network for ENC updates.

(d) **Media and Schedule for Distribution**. In order to support at least Semi-automatic updating via hard media, ENC Updates shall be prepared and provided in adequate quantities for distribution on a regular schedule adequate to support safe navigation. The scheduled broadcast on INMARSAT-C SafetyNET of update information for Fully Automatic updating for the ENC at sea is desirable. Other updating services, such as direct access by the mariner via high speed telecommunications networks to the Issuing Authority's ENC update information, should be investigated.

(e) **Data Integrity.** The ENC will employ the error detection scheme designated in the ENC Product Specification in S-57.

(f) **Availability to Other Issuing Authorities**. ENC Updates should be made immediately available to other Issuing Authorities.

(g) **Method for Implementation.** Official ENC Updates shall conform to the ECDIS Revision (ER) Application Profile of S-57.

(h) **Distinguishable Update.** The ENC updates must allow the changes to be distinguished on the ECDIS display.

(i) **Identification**. Each update shall be clearly and uniquely identified as described in the Product Specification of S-57.

(j) **Broadcast Medium**. Scheduled broadcasts of ENC Updates, e.g. over the INMARSAT-C EGC SafetyNET service, should be established as early as feasible worldwide.

(k) **Non-availability of Updates**. A nil message should be issued if no updates are available for a scheduled broadcast.

(l) **Bilateral Arrangements.** The relationship and legal liability arrangements between the HO and the Issuing Authority for updating are matters to be determined between the parties involved.

(m) **New Editions of ENCs**. A new edition of an ENC should be announced at least 8 weeks, and made available at least 4 weeks, prior to its effective date to ensure timely receipt by affected ECDIS users. On the effective date of the new edition, the previous edition will be superseded and no further Updates will be issued for it.

3.3 Distributors

3.3.1 General

(a) **Distribution Network**. A distribution network for ENC Updates will exist as established by the Issuing Authority.

(b) **Scheduling.** Updates received from the Issuing Authority should be made available to the mariner within a time interval adequate to support safe navigation.

(c) **Quality Management**. Distributors should establish appropriate quality management infrastructures for the distribution of ENC Updates.

3.3.2 Fully Automatic Updates

(a) **Broadcast Data Integrity**. To ensure the integrity of the broadcast update, effective safe transmission mechanisms and/or error detection methods should be employed.

3.3.3 Semi-automatic Updates

(a) **Hard Media.** ENC Updates should at least be made available on 3.5" high density diskettes.

(b) **Telecommunications.** On-demand service via a telecommunications link should be made available.

(c) **Stocks of Updates**. Distributors of ENCs should keep hard media stocks of all ENC Updates in effect against the ENC editions stocked.

(d) **ENC and its Updates**. All updates in force for an ENC edition should accompany that ENC upon distribution.

(e) **User-friendliness**. Semi-automatic Updating of the ENC occurs at the ECDIS equipment, and should be accomplished by the mariner without the need for the assistance of the Distributor or Manufacturer.

(f) **Repackaging**. Distributors may repackage the ENC Updates provided that the contents are not altered.

3.4 ECDIS Manufacturers

3.4.1 General

(a) **Data Integrity**. The ECDIS should be able to process ENC Updates without degradation of the information content of the ENC or ENC Update. For example, all information regarding attributes, logical relationships, geometry, and topology must be accounted for.

(b) **Verification of Application**. The ECDIS should provide a method to ensure that updates have been correctly applied to the SENC. Those updates are either an Official ENC Update integrated into the SENC display or temporary information that was entered manually.

(c) **Integrated/Non-integrated Updates Distinction**. Updates should be clearly distinguishable on the display. Once accepted, integrated updates should be indistinguishable from ENC data. Non-integrated updates (i.e., those entered manually) shall be distinguishable as described in IHO S-52, App.2/2.3.4.

(d) **Storage Separation**. ECDIS should store all updates separately from the ENC. However, such separate storage may utilize the same data storage device.

(e) **Recall for Display.** It should be possible on demand to review previously installed updates.

(f) **Compatibility**. ENC Updates comply with the ENC Product Specification of IHO S-57.

(g) **Non-interference**. ECDIS should be able to receive updates without interfering with its current operation.

(h) **Log File**. ECDIS should keep a record of updates, including time of application and identification parameters described in paragraph 3.2 (i), through a logfile. The logfile should contain, for each update applied to or rejected by the SENC, the following information:

.1 date and time of application/rejection;
.2 complete and unique identification of update as described in the S-57 Product Specification;
.3 any anomalies encountered during application;
.4 type of application: manual/automatic.

(i) **Update out of sequence**. The ECDIS should warn the user when an ENC Update is applied out of sequence, terminate the update operation and restore the SENC as it was before the application of the Update File.

3.4.2 Automatic Update

(a) **Interface**

(i) **Fully Automatic Updates.** The ECDIS should be capable of being interfaced to an INMARSAT-C EGC SafetyNET-capable receiver for direct data transfer of ENC Updates.

(ii) **Semi-automatic Updates.** The ECDIS should be capable of receiving ENC Updates in standard IHO format by 3.5" high density diskette and through a telephone network.

(b) **Reception of ENC Updates**

(i) ENC Update data shall be recorded automatically in the update storage of the ECDIS.

(ii) The identification of the Issuing Authority of the ENC Update should be checked for conformance with the corresponding identifier of the ENC.

(iii) If any errors are detected from the receiving device, the reception procedure shall be terminated and the ENC Update flagged invalid in the record of updates. The user should be informed of the corruption.

(c) **Sequence Check**. The following sequence number checks should be performed at the time of application, for sequential and cumulative updates:

.1 File extension of the ENC Update
.2 Update number of the ENC Update
.3 Update sequence number of the individual records in the ENC Update

Refer to the ENC Product Specification of S-57 for details on how the sequence numbers are encoded in the ENC Update.

(d) **Consistency Check**. The mariner should be warned of any previous ENC Updates which have not been successfully applied.

(e) **Geographic Applicability**. ENC Updates not relating to a cell within the set of ENCs in the ECDIS may be discarded.

(f) **Summary Report**. A summary report for each of the Issuing Authority's Official Update Files should be given after completion of receipt containing at least:

.1 identification of Issuing Authority;

.2 update numbers of the Update Files;

.3 Cell Identifiers of cells affected;

.4 Edition Number and date of cell involved;

.5 number of updates in the affected cells.

(g) **Review of ENC Updates**. It should be possible for the mariner to review the updates applied through displaying the SENC contents with the updates highlighted.

(h) **Modification of Updates**. Rejection or amendment of an update by the mariner shall be achieved by the manual update method. The questionable update should be noted as an anomaly in the Log File [See 3.4.1 (h)].

(i) **Formatted Non-integrated Updates**, for example a temporary military exercise area, will be processed as manual updates.

3.4.3 Manual Update

(a) **Keying and Symbology**. The ECDIS should enable manual entry of updates for non-integrated presentation on the display. A capacity should exist to enable the mariner to:

.1 enter the update so it can be displayed as described in S-52 App.2.

.2 ensure all update text information relevant to the new condition and to the source of the update, as entered by the mariner, is recorded by the system for display on demand.

(b) **Indications and Alarms**. The ECDIS should be capable of sensing indications and alarms related to non-integrated (manual) updates, just as it does for integrated ENC Updates.

(c) **Presentation**. Manual updates shall be displayed as described in S-52, Appendix 2/2.3.4.

(d) **Text**. It should be possible to enter text into the ECDIS.

(e) **Archiving of Manual Updates**. It should be possible to remove from the display any manual update. The removed update should be retained in the ECDIS for future review until commencement of the next voyage, but will not be otherwise displayed.

3.5 ECDIS Users

3.5.1 General

(a) **Responsibility**. As they are for the paper nautical charts, mariners are responsible for maintaining an up-to-date SENC.

(b) **Legal Updates**. Only official ENC Updates, i.e. those provided in digital format by the Issuing Authority responsible for the ENC carried by the vessel, shall be integrated into the SENC. All other updates or other navigation safety information should be entered manually. This additional information could come from Notice to Mariners, local Notice of Mariners, radio navigational warnings, mariner's notes, etc.

(c) **Status of Manual Updates**. Manual updates shall be considered as interim measures only, and should be replaced at the earliest opportunity with ENC Updates from the Issuing Authority.

ANNEX A - DEFINITIONS AND ACRONYMS

Automatic Update	Either the Semi-Automatic or the Fully Automatic (see definitions) means of updating the ENC/SENC.
Cell Identifier	Unique number assigned to each individual cell.
CCIR	International Radio Consultative Committee.
CHRIS	Committee on Hydrographic Requirements for Information Systems.
Corrupted Data	Any change in data introduced during, and as a result of, its transmission.
ECDB	The master data base for Electronic navigational Chart Data (ENCD), held in digital form by the national hydrographic authority, containing chart information and other nautical and hydrographic information.
ECDIS	Electronic Chart Display and Information System means a navigation information system which with adequate back-up arrangements can be accepted as complying with the up-to-date chart required by regulation V/20 of the 1974 SOLAS Convention, by displaying selected information from a system electronic navigational chart (SENC) with positional information from navigation sensors to assist the mariner in route planning and route monitoring, and if required display additional navigation-related information.
EGC	Enhanced Group Call - A global automatic service by INMARSAT for addressing commercial messages (FleetNET) or marine safety information (MSI) (SafetyNET) to groups of ships or all vessels in both fixed and variable geographical areas. Data transmission is based on INMARSAT-C and takes place at an effective transmission rate of 600 bit/s.
ENC	Electronic Navigational Chart means the database, standardized as to content, structure and format, issued for use with ECDIS on the authority of government authorized hydrographic offices. The ENC contains all the chart information necessary for safe navigation and may contain supplementary information in addition to that contained in the paper chart (e.g. sailing directions) which may be considered necessary for safe navigation.
ENCD	Electronic Navigational Chart Data - The national data for an Electronic navigational Chart (ENC) in a format acceptable to an ENC Coordinator.
ENCDB	Electronic Navigational Chart Data Base -The master data base for production and maintenance of the ENC, compiled from national ENC data (ENCD).

Fully Automatic Updating	The application of corrections to ENC data in the SENC in a fully integrated state, without human intervention at the receiving end.
GMDSS	Global Maritime Distress and Safety System. The communication service, co-ordinated worldwide, comprising functions which include among others, the: - dissemination of marine safety information: broadcast of navigational and meteorological warnings, Notices to mariners, and urgent information to shipping; - general radio communications: those communications between ship stations and shore-based communication networks which concern the management of the ship and may have an impact on its safety, and - bridge-to-bridge communications: inter-ship VHF radiotelephone communications for the purpose of assisting the safe movement of the ship.
HO	Hydrographic Office.
IHO	International Hydrographic Organization.
IMO	International Maritime Organization.
IMO PS	International Maritime Organization Performance Standard for ECDIS, Assembly Resolution A.817 (19).
INMARSAT	International Mobile Satellite Organization.
Integrated Update	A correction to the ENC data in the SENC which is fully integrated into the ECDIS display and can be acted on by ECDIS software in the same manner as is the data from the basic ENC.
Issuing Authority	The official agency which issues the ENC and ENC updates. Its identity will depend on the organizational structure adopted for ECDIS support.
Local Updates	A generic term to indicate all update information other than official updates, regardless of source; for application as a manual update only.
MSI	Maritime Safety Information - Navigational and meteorological warnings, Notice to Mariners, meteorological forecasts, and other urgent safety messages.
NAVAREA	A geographical sea area established for the purpose of co-ordinating the transmission of long range Radio Navigational Warnings.
NAVINFONET	Navigational Information Network - A US (NIMA) automated service for providing Notice to mariners and other safety information via digital link at user request.

NAVTEX	Narrow-band direct-printing telegraphy system for transmission of navigational and meteorological warnings and urgent information to ships.
NBDP	Narrow Band Direct Printing.
NCS	Network Coordination Station, an INMARSAT Coast Earth Station (CES) configured to process messages in the EGC System.
NON-Integrated Updates	All correction information other than Official Updates to be applied only by manual update methods in a manner that does not alter the ENC content in the SENC or on the display.
NTM	Notice to Mariners - A periodical or casual notice issued by hydrographic offices, or other competent authorities, regarding changes in aids to navigation, dangers to navigation, important new soundings, and, in general, all such information as affects nautical charts, sailing directions, light lists and other nautical publications.
Official Updates	Updates provided in digital format by the Issuing Authority of the ENC being corrected, for integration with the ENC data in the SENC.
RENC	Regional ENC Coordinating Centre.
SafetyNET	INMARSAT Broadcast Service for MSI - A service provided through INMARSAT'S EGC system which will be used by Administrations for the promulgation of Maritime Safety Information, such as NAVAREA and storm warnings, Notice to Mariners, shore-to-shore distress alerts and routine weather forecasts to the high seas and those coastal waters not served by NAVTEX. IHO proposes to include promulgation of electronic chart corrections as well.
Semi-Automatic	The application of corrections to ENC data in the SENC Updating in a fully integrated state, by hard media or telecommunications transfer in a manner which requires human intervention at the ECDIS interface.
SENC	System Electronic Navigational Chart means a database resulting from the transformation of the ENC by ECDIS for appropriate use, updates to the ENC by appropriate means and other data added by the mariner. It is this database that is actually accessed by ECDIS for the display generation and other navigational functions, and is the equivalent to an up-to-date paper chart. The SENC may also contain information from other sources.
SES	INMARSAT Ship Earth Station.
SOLAS	Convention on Safety of Life at Sea.
Update Storage	An area on a physical storage device in the ECDIS where the ENC Updates are kept separately from the ENC.

Update Set	The collection of corrections to ENC data promulgated together by an Issuing Authority on a schedule basis. Equivalent to the periodic set of Notice to Mariners issued for the correction of paper charts and nautical publications.
WEND	Worldwide Electronic Navigational Chart Database.
WMO	World Meteorological Organization.
WWNWS	World Wide Navigational Warning Service - A coordinated global service for the promulgation by radio of information on hazards to navigation which might endanger international shipping.

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ANNEX B - CURRENT UPDATING PRACTICE FOR PAPER CHARTS

1. NOTICE TO MARINERS

1.1 Traditional services provided by a National Hydrographic Authority include a routine system for the update of all conventional charts on regular sale or supply to users. Certain chart producing nations produce a global product; those countries with smaller portfolios cover only their areas of interest and responsibility.

1.2 Generically, these small corrections have been termed 'Notice to Mariners'. Normally they are collated on a weekly basis and mailed, through a series of agencies or directly, to the customer. Some authorities, however, also produce such Notices on a daily basis to spread out the load of the bulk stock chart correction within the office and at major sales agencies, and to expedite the information to other chart producing authorities.

1.3 The weekly edition of Notice to Mariners may contain several independent sections, viz:

(a) General explanatory notes (a standard item) and current index;

(b) Chart correcting notices;

(c) Notices announcing the publication of new charts, new editions, cancellation of existing charts and consequential effects on remaining charts;

(d) Notices affecting the total range of an HO's publications with regard to:

.1 content and change;

.2 supersession;

.3 recapitulatory listing of NAVAREA warnings in force for a particular area and adjacent areas. In addition, an edited listing of important messages for the remaining NAVAREAs worldwide may be included;

.4 corrections to List of Lights;

.5 corrections to Sailing Directions; and

.6 corrections to List of Radio Signals.

1.4 An individual Notice must be framed in such a way that it provides clear, concise and unambiguous instructions to the mariner for the correction of his copy of the chart.

1.5 As the selection of material for publication of an individual notice is governed only by considerations of safety of navigation, it follows that any collection of notices will interest all classes of vessels from small to large.

1.6 In addition to the conventional printed paper Weekly Edition published by National Hydrographic Authorities, certain supplementary services such as the United States' Navigation Information Network (NAVINFONET) exist. NAVINFONET provides access by digital data link via the telephone system to the data used to print the weekly Notice to Mariners, in-force Broadcast Warnings, corrections to Light Lists, etc. Although digital, the data can only be printed and is therefore equivalent to, but more immediately accessible than, the conventional means of obtaining this information. NAVINFONET can be accessed by telephone modem and therefore by ships at sea via telephone link using INMARSAT-A, and is available to all.

1.7 It is the mariners' responsibility to insert an individual Notice correctly on his chart. He is advised to adopt a standard format for symbology and to record the presence of a change on both his chart and his folio log.

1.8 To aid this procedure, each Notice is identified uniquely by a number which, after the correction is made, is added to the correctional block of the chart to provide a historical record. Notices are valid only until they are superseded by a New Edition or New Chart of the area concerned. The mariner is also advised as to the source of the correctional data.

1.9 As an aid to plotting, a tracing showing the correction to be applied may be produced by the National Hydrographic Authority. This is capable of being reproduced and distributed to chart users to aid the process of hand correcting. In some agencies the correctional load to a particular chart can be quite high if notices held are above the norm and the individual correction is complex (i.e. the insertion of a lengthy submarine cable, or the alteration of a multi-sectored light or routeing measure).

1.10 The time comes when material is at hand whose significance demands action by Notice to Mariners but which, by its very length or complexity, will overwhelm and confuse the individual chart corrector. In such circumstances one of two methods of approach can be chosen by the National Hydrographic Authority. Firstly, the material could be incorporated into a new edition of the chart or, secondly, it could be promulgated as a chartlet (block or patch) to be affixed physically to the current edition of the chart.

1.11 Such chartlets bear an individual Notice number, have their limits chosen carefully with respect to fitting points, and are chosen to be of the minimum size necessary to encompass the new material properly. They are perforce expensive to produce, require special printing and collating techniques and, by virtue of being distributed together with all other notices, have a large degree of redundancy.

1.12 In addition to chart correcting notices, mariners are advised of Temporary or Preliminary matters affecting their charts by a series of printed 'T&P' Notices. These notices are designed to be of short term duration, typically under two years. An updating list of effective T&P Notices may be printed monthly and incorporated in totality in Annual Notices. The mariner is advised to mark on his chart the existence of such a notice and to keep readily available a corrected file of all notices in force.

1.13 Local harbor authorities may issue Notice to Mariners in a local series. These changes should be noted by the mariner who is using the area and maintained on file. Such information does not constitute a permanent change to a particular chart until such time as it is promulgated by the National Authority with responsibility for that chart.

1.14 The criteria for updating the Electronic Chart will be the same as that explicit above which governs the updating of the paper chart. Only the procedures will change. The updating service must take full advantage of the capabilities of digital data transfer modes and of digital data manipulation to ensure a fully adequate and safe ECDIS.

2. RADIO NAVIGATIONAL WARNINGS

2.1 Radio Navigational Warnings provide early warning of navigational hazards.

2.2 Such warnings are normally transient and of short duration or speak of matters not relevant to the chart, such as an unwieldy tow, and thereby do not warrant chart correcting action. Those that do contain information of such importance as to warrant notice action, i.e. a newly sunken wreck in shallow waters, will remain in force and be broadcast until consequential chart correction action (i.e., issuance and distribution of a Notice to Mariners) can be taken. This may mean an individual warning message will remain in force for up to 6 weeks. The mariner is expected to take note of these warnings and review them when he is approaching their geographic area of application.

2.3 The IMO/IHO World Wide Navigational Warning Service (WWNWS) exists to:

.1 collect, exchange and collate navigational safety information;

.2 broadcast messages in a way that can be received and understood by all mariners; and

.3 control the huge amount of raw information so that the mariner is not overloaded.

2.4 To achieve this, 3 types of Radio Navigational Warnings have been established, each designed to serve the needs of the mariner in a particular location by exploiting the characteristics of the radio networks he will be using. They are:

(a) The NAVAREA Warnings Service which broadcasts warnings concerning routeing and passage along major shipping lanes to ships on the high seas by radio telegraphy at HF worldwide. In some NAVAREAs duplicate broadcasts by HF radio teletype or at MF, or by SafetyNET EGC, are available as well. Sixteen designated area coordinators manage such broadcasts.

(b) The second level of warnings, and perhaps the most prolific, are Coastal warnings. These are often the most important warnings, and have traditionally been broadcast using voice communications at both MF and VHF. These warnings give short term notice of generally transient hazards, such as lights temporarily extinguished, of interest only in the vicinity of the transmitter. Currently, a number of coastal warnings are also broadcast as NAVAREA warnings. With the implementation under GMDSS of mandatory carriage of a NAVTEX receiver by convention ships in August 1993, however, in areas of NAVTEX coverage only coastal warnings of major importance, such as those which might cause a mariner to amend his planned track substantially, are also disseminated by transmission as a NAVAREA warning.

(c) The final, lower level of radio warning is the Local warning. It may be issued by Port Authorities and sometimes by local Coast Guards, for broadcast usually on VHF voice and only in the national language.

3. THE GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM (GMDSS)

3.1 The radio navigational warning is the first of the three basic information categories to achieve a measure of international coordination and standardization. The total package of Maritime Safety Information (MSI) requires the addition of meteorological broadcasts and search and rescue information, and also includes Notice to Mariners.

3.2 GMDSS has been developed by IMO (with IHO, WMO, INMARSAT and others) to upgrade existing worldwide distress and safety communications by the mid-1990's.

The main purpose of GMDSS is to support distress notification and search and rescue operations. GMDSS also provides for urgency and safety communications and for the dissemination of maritime safety information including Notice to Mariners, and navigational and meteorological warnings. GMDSS will merge and unify the existing land based MSI dissemination systems with an upgraded INMARSAT service.

3.3 IMO initiated a study of satellite communications systems in 1972 which led to the formation of the International Maritime (now «Mobile») Satellite Organization (INMARSAT) in 1979. The INMARSAT system consists of four geostationary satellites covering the Atlantic, Indian and Pacific Oceans, giving comprehensive coverage worldwide with the exclusion only of the Polar Regions. Satellites link with terrestrial telecommunications stations known as Coast Earth Stations (CES) located around the world. The INMARSAT shipboard installation is known as a Ship Earth Station (SES) and the most prevalent existing equipment is designated INMARSAT-A. INMARSAT-A supports voice telephone and data telex services, teleprinters, video display units, fax machines and data transmission equipment. To use INMARSAT-A the vessel must be fitted with a gyro stabilized one meter diameter dish antenna. However, slower and cheaper INMARSAT SES equipment has recently become available. It supports, amongst other things, data transmission for telex at a 600 bit/sec rate using a small omnidirectional antenna. Class II, the most common configuration, and Class III INMARSAT-C receivers support Enhanced Group Call (EGC), a global automated service capable of addressing commercial messages (FleetNET) or MSI (SafetyNET) to groups of ships or all vessels in both fixed and variable geographic areas. CES which are specially equipped to handle messages in the EGC system are designated Network Coordinating Stations (NCS).

3.4 Under the GMDSS, the present day NAVAREA radiotelegraphy service will be ineffective and is being replaced by a satellite broadcast service using INMARSAT's Enhanced Group Call (EGC) SafetyNET facilities. NAVAREA warnings traffic volume will be greatly reduced by the worldwide implementation of NAVTEX Broadcast Services (see para. 3.6 below).

3.5 CCIR has found that correction information to ships at sea may be communicated by INMARSAT-A or-C(EGC), or by VHF. (See CCIR Recommendation 826.)

3.6 The NAVTEX Service, now nearly fully established worldwide, broadcasts warnings in the area up to at least 200 miles offshore on a time share basis at 518 kHz to a dedicated receiver on board ship. Because most warnings pertain to coastal areas and the NAVTEX transmissions are frequent, many warnings which were required to be promulgated through the NAVAREA service are now being broadcast only by NAVTEX.

3.7 It is again emphasized that the text of the Notice to Mariners and Radio Warnings is written to be clear, concise and unambiguous to the mariner reading the text. However, utilization of the correction information by ECDIS makes different demands on its structure; therefore messages prepared for the automated update of the SENC or its display will be entirely different.

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ANNEX C - ESTIMATE OF DATA VOLUME

1. A rough estimation of the data volume for automatically updating the SENC has been carried out based on an evaluation of the Notice to Mariners (NtM) by Germany's Hydrographic Authority, the Bundesamt für Seeschiffahrt und Hydrographie (BSH), with the objective of estimating the data volume to be transmitted by slow satellite broadcast (INMARSAT C-EGC) of only that information which is considered necessary for safe navigation.

2. BSH evaluation of NtM

(a) The BSH evaluation rested on the following assumptions:

.1 only the needs of the larger vessels (Draft ≥ 5m) have been considered (approximately 70% of the total NtM chart correction information published applies)*;

.2 if any corrections affected other objects contained in the charts (e.g. light sectors), these have been taken into account as additional (indirect) corrections, if they were deemed necessary for safe navigation; (this accounts for an additional 10% corrections);

.3 corrections were taken into account only once regardless of the number of charts affected, because of the anticipated efficiency in scheming the ENC.

(b) The evaluation was carried out by mariners of the BSH who are in charge of publishing the German NtM.

(c) The evaluation covered only the BSH sea area 20 (European North Ocean including North Sea), shown in Fig. C-1, an area, however, which is known to be heavily affected by chart updates. Twenty weeks of consecutive NtM were processed for this area. The area was considered representative of the nine such areas which encompass the oceans of the world.

(d) The investigation resulted in a table containing the frequency of insertions, deletions and additions for 18 distinct types of chart information, involving 1127 corrections affecting 1255 geographical positions (see Table C-1). For items requiring attributes, the average number of those attributes has been determined. Line features (such as depth lines, cables, etc.) were estimated to contain 10 positions on average.

** In the event ships of all drafts were to be served, the total data volume would increase to 143% of the total noted for only the larger vessels.*

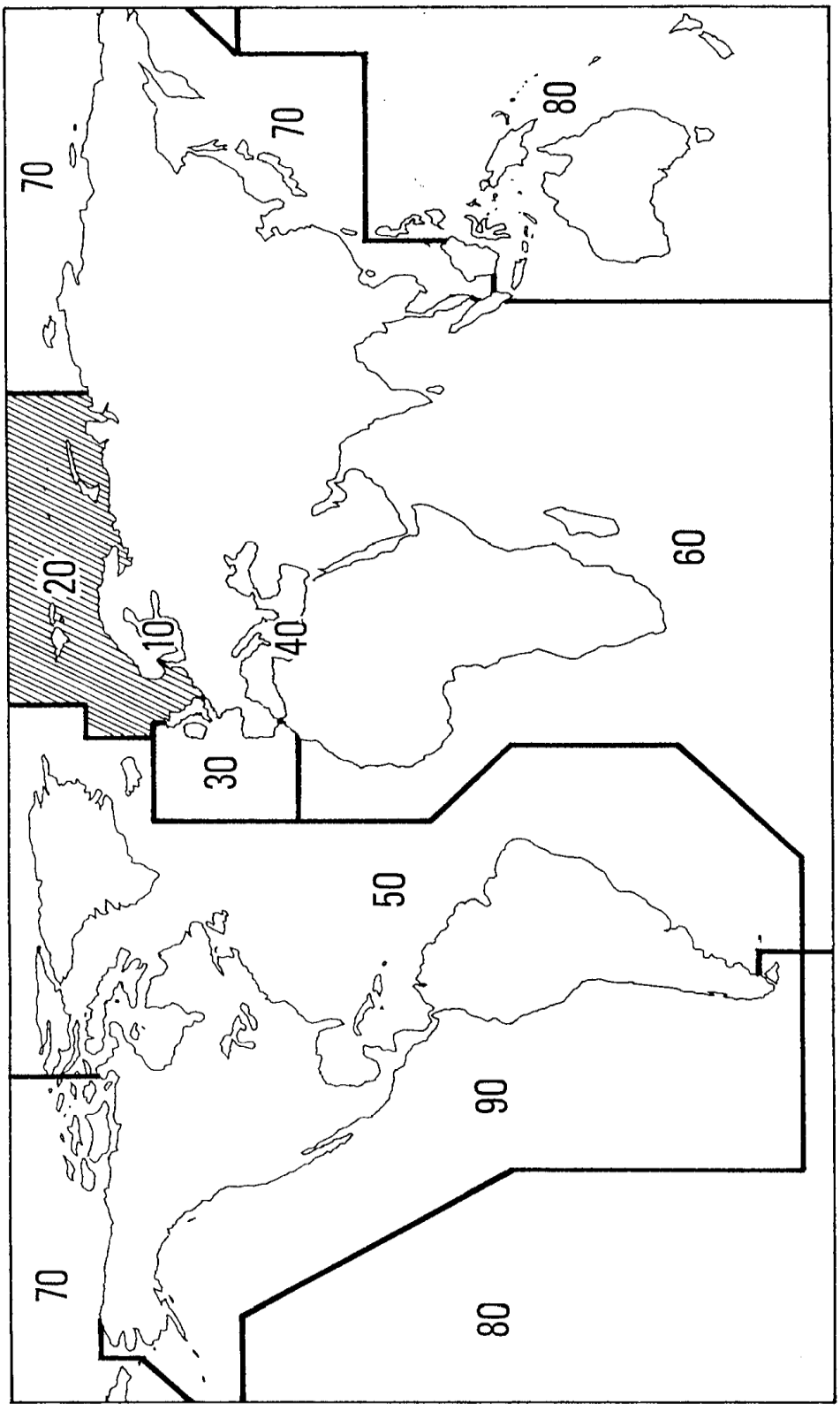

Fig. C-1 - Area of BSH Traffic Volume Study

Table C-1 - Notice to Mariners Correction instructions

Insert	Delete	Add	Subject of correction
11	4		boundaries; cables, moles
22	22	3	remarks (20 characters)
78			lights with full annotation (6 attributes)
17	16		light abbreviation
3	3		range
85	71		sectors
		1	light buoys with full annotation (5 attributes)
	66		light without annotation
10	75		light buoys without annotation
87			buoys with full annotation (3 attributes)
37	162		buoys without annotation
5	1		platforms
2	5		depth isolines
25	79		spot soundings without septh lines
6			with depth lines
100			depth with depth lines + attributes (obstructions)
13	6		wrecks and foul ground
7	9		other symbols

3. Data Volume

In order to estimate an upper bound, including the potential impact of accompanying text, the overhead factor has been set as ten times the basic information. The resulting figure for worldwide coverage is approximately 135,000 bytes (135 kbytes) to be transmitted weekly for automatic updating. Setting, for transmission purposes, 1 byte equal to 10 bits, the data volume may be estimated at 1,350 kbit per week. Repetitive transmissions in order to ensure error-free receipt are not considered.

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Annex B to letter EUWG 01/2010
(CSPCWG 6-09.1B comprises comments from CSPCWG secretary)

CSPCWG 6-09.1B

PART B

SECTION 600

CHART MAINTENANCE

Title page, Contents list, Record of Updates, Headers and Footers, page numbers, intentionally blank pages, etc, all to be formatted and inserted in accordance with general format and layout of M4.

Section 600
CHART MAINTENANCE

B-600 CHART MAINTENANCE

The maritime world, as portrayed in the nautical chart, is not static. For example: increasingly sophisticated surveying methods provide more accurate details of the bathymetry, which in some areas is constantly changing; shipping patterns and ships' draughts change; ports are developed; aids to navigation are changed and moved; safety and environmental concerns result in new routeing measures and navigational restrictions; exploitation of natural resources is increasing; new navigational obstructions are discovered.

All this nautical information must be assessed and brought to the attention of the mariner as required, in order to support SOLAS and environmental protection. To achieve this goal, nautical information must be systematically and continually collected from many different sources, eg surveyors, maritime institutes, harbour masters, lighthouse authorities, so that charts can be maintained.

Some information is safety related and must be passed to the mariner urgently; other information, while navigationally significant, is less urgent; some is only useful for making up the overall picture of the maritime environment and is not urgent. The importance of keeping charts up-to-date cannot be over-emphasized. If charts are not kept up-to-date, their value is seriously diminished and they may become misleading, potentially contributing to maritime casualties.

This section provides an explanation of the current methods of promulgating information and some guidance on assessing new information to decide which method of promulgation may be appropriate. IHO Technical Resolution A1.20 also provides a short list of the actions necessary for the 'Reporting and Publication of Dangers to Navigation'.

In common with the rest of S-4, this section has application in detail to paper charts but the general principles apply equally to paper and electronic charts. [colemana6]

Because of the differences in the updating systems (including the application of the update by the chart user) and the products' contents, the method for including new information in charts and ENC cells may diverge, eg:

- A paper chart update by Notice to Mariners (NM) Block may require a New Edition for an ENC cell
- A New Edition of a paper chart may be issued as an ENC update, without the requirement for an ENC New Edition
- A change for which a Preliminary (P) or Temporary (T) NM is issued for a paper chart may be included as an update to an ENC cell
- The ENC may contain information which needs updating, which is not included in the paper chart.

~~These examples of possible divergence are brief statements: the detailed application is currently (2009) being considered by the ENC Updating WG and guidelines will be issued in due course.~~

[colemana7]B-601 CHART MAINTENANCE TERMS AND METHODS

B-601.1 **Chart series.** A chart series is a term referring to a group of charts covering a wide geographic area, such as:

- a national series (ie all the charts published by a hydrographic office);

- a world series (charts covering the entire world, published by a few hydrographic offices);
- The International Chart Series (see S-11 for further details);
- Special purpose series, eg Leisure, Bathymetric, Routeing.

Chart series need to be maintained and kept under review, eg for changing shipping patterns, new port developments, offshore industries.

B-601.2 **Chart scheme.** A chart scheme is a term referring to a group of charts covering a specific geographic area. It may be a small area (such as two or three charts covering the approaches to, and berthing arrangements for, a particular port), a much larger area (such as a continuous coastal series for a nation), an International Chart Scheme (such as all the International Charts covering the geographical extent of a Regional Hydrographic Commission) or the scheme of small-scale ocean charts. For guidance on preparing chart schemes, see S-11 Part A.

B-601.3 [colemana8]**New Chart.** A New Chart (NC) is the first publication of a nation's chart which may be additional to existing cover and will not usually supersede existing charts on a one for one/ scale for scale basis. A NC will either:

- portray an area not previously charted at the scale shown. (Note: minor changes to scale or limits of inset plan(s) or of plan(s) on a sheet of plans would not constitute a NC); or
- provide significantly changed coverage to the existing chart, eg:
  - by covering new port development or a new routeing measure
  - by changing the area charted (by more than approximately 25%); or
- be a significantly modernized version (eg modernized symbology, changed depth units) of an existing chart; or
- be an adoption of an international (INT) or national chart, first published by another nation.

A NC does not necessarily contain new information and all information contained may have been previously published in other charts.

The allocated chart number and usually its title should be different from any chart that is cancelled consequent on its publication.

B-601.4 **New Edition.** A New Edition (NE) is a new publication of an existing chart, containing changes significant to navigation which will normally have been derived from more recent information. It will usually include changes additional to those previously promulgated in Notices to Mariners (NM). However, it should be noted that parts of the chart may remain unchanged.

The previous edition must normally* be cancelled and no longer be maintained by NM (and thus not be SOLAS carriage-compliant); this should be made clear to all users in the announcement of the NE. (*Note: the sole exception is explained at B-621).

The national chart number must not be changed. However, if the chart becomes INT at a NE, an INT number must be added (see B-251.1(I) and B-251.2(I)).

The following changes to limits and/or content are permissible within the terms of a NE:

- change to horizontal or vertical datum;
- change to limits up to approximately 25% of the chart area (eg adjustment to include significant feature(s) just off existing chart limits);
- change to limits and/or scale of an inset plan or of plan(s) on a sheet of plans;
- insertion/deletion of inset plan(s) on either a main sheet or a sheet of plans.

A NE should include all outstanding updating information that has accumulated since the previous edition was published. However, for various reasons, this may not be possible or desirable. In such cases, a Limited NE may be appropriate; see B-601.5.

In some circumstances, eg rapidly changing areas such as river estuaries, regular (eg annual) NEs may be appropriate, in order to enhance user confidence in the chart.

A NE is also an opportunity to update the chart for changes in policies and practices since the last edition, to enhance standardization. This might include, eg:

- removing or replacing obsolescent chart symbols;
- reviewing K29 wreck symbols to confirm from records that they are still not considered dangerous to any surface vessels capable of navigating in the vicinity (see B-422.6-7);
- updating notes;
- adding English language text (see B-510.4);
- use of colour.

B-601.5 **Limited New Edition.** A Limited New Edition (LNE) may be prepared if there is information which needs to be included on a chart quickly, but which cannot be promulgated by Notice to Mariners (NM) or NM Block, because of the geographical extent or complexity of the information, or where there are other reasons to produce a NE to short time scales. Examples are:

- safety-related information too complex or of too large a geographical extent to be promulgated by NM or NM Block, such as:
    - new and revised routeing measures;
    - insertion of a new pipeline/cable following a complex route;
    - insertion of significantly changed depth information;

  Note: in the above cases, which are safety-related and therefore more urgent, it may be appropriate to issue a Preliminary NM as early as possible, see B-634.1, to cover the interval before the LNE can be published.
- change to horizontal datum for a series of charts, requiring them to be published close together;
- updating an overlapping or smaller scale chart to maintain consistency with another NE;
- fully include a new survey (which may have been partially included by NM);
- updating magnetic variation lines (isogonals) for a new magnetic epoch.

Limited New Editions may be referred to as Urgent NE, Priority NE, NE in lieu of NM Block or other terms.

An HO may distinguish different types of LNE internally and for prioritization of work, but this is of no significance to the chart user as all NE (including LNE) cancel the previous edition (for further details, see B-601.4). Therefore, a LNE should be announced as a NE for the chart user; however the announcement of the publication of the LNE should indicate its limited nature, see B-635.1.

B-601.6 **Reprint.** A reprint (also called Revised Reprint or Corrected Reprint) is a new print of the current edition of a chart incorporating no amendments of navigational significance other than those previously promulgated in Notices to Mariners (if any). It may, however, contain amendments from other sources provided they are not significant to navigation. Previous printings of the current edition of the chart always remain in force.

Because previous printed copies always remain in force, great care is required when incorporating any new information to ensure that the new information would never need updating by Notice to Mariners. In such cases, a NM would then only apply to some copies of the chart, which could cause confusion to the user.

Reprints must include the number of at least the latest NM included in the reprint, in the bottom left hand corner of the chart outside the border. A list of all NMs included since the previous reprint, or the latest edition date, may be given.

For special regulations concerning reprints, see A-404.

B-601.7 **Notice to Mariners (NM).** NM are used for the prompt dissemination of information which is safety-related or which otherwise needs to be advised to the mariner urgently. They are regularly published (usually weekly, fortnightly or monthly) by most hydrographic offices, in paper booklets and/or on websites. Electronic chart updates may be promulgated on digital media, or by utilizing remote updating systems. More details of the following types of NM are given in B-630 to B-635:

a. Chart-updating (permanent) textual NM.

b. NM block (also called a Chartlet or Patch).

c. Temporary (T) NM.

d. Preliminary (P) NM.

e. Miscellaneous notices.

B-601.8 **Radio Navigational Warning.** Radio Navigational Warnings (RNW) are used to promulgate the most urgent information. They are not intended for updating charts directly. Unless it is of very temporary application, the information will normally require a subsequent (T) or (P) NM or chart-updating NM, as appropriate, (Technical Resolution F4.4). Any NM (and ENC update) must be published before the RNW is cancelled[colemana9].

A recapitulative list of RNW in force may be included in the periodical NM booklet or maintained on a website, see B-630.3.

For further details of systems for broadcasting RNW, see IHO Publication S-53 (Edition 2009), which states that: 'Navigational warnings shall remain in force until cancelled by the originating coordinator. Navigational warnings should be broadcast for as long as the information is valid; however, if they are readily available to mariners by other official means, for example in Notices to Mariners, then after a period of six weeks they may no longer be broadcast'.

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B-610 ASSESSMENT OF INCOMING INFORMATION

Assessment is the process of examining incoming information against existing information in chart products and Geographic Information System (GIS) databases (see B-641.1) to:

- establish the credibility of the source, including the authority of the source provider;
- identify the differences;
- consider the significance to the chart user of the differences;
- identify the most appropriate actions to incorporate that data into:
  - GIS databases;
  - chart products.

All newly-received information of possible use for charting must be examined against all the relevant charts (latest edition corrected for all NMs). Differences assessed as significant for safe navigation must be promulgated to chart users by the appropriate method detailed in section B-600. Differences which are not safety-related should be recorded, so they can be retrieved for inclusion in the next appropriate revision of the chart.

Where newly-received data is assessed to require NM action, but the details are insufficient to draft a chart-updating NM, it will be necessary to seek further information from the source provider without delay. In such cases, a (P) NM may be issued in the interim to provide the available information to the mariner (see B-634.1).

B-611 CREDIBILITY OF SOURCES

Establishing the credibility of sources is a matter for professional judgement and experience. All incoming data must be checked for possible errors and inconsistencies. It is essential that the quality of all positional and depth data is established before use.

Where there are conflicting or inconsistent sources of information, or there are doubts about the accuracy or validity of the information, clarification should be sought from the appropriate authority. If no answer is forthcoming, a judgement must be made. In such instances, it is important to record the reasons for the decisions, for use when considering later information or for future research.

The following source data types are commonly received by hydrographic offices. The following guidelines may provide assistance. They apply to source material for primary charting areas and for areas largely derived from the publications of other hydrographic offices.

B-611.1 **Official (and officially sponsored) surveys** prepared specifically for nautical charting should be validated by competent surveyors. It must be ensured, as far as possible, that any errors and uncertainties arising from the method of surveying are understood and that the survey remains acceptable for use; see IHO publication S-44.

.B-611.2 **Unofficial surveys** are undertaken for oil companies, cable laying companies or other contractors and are not specifically designed for charting purposes. Such surveys are often supplied to hydrographic offices but should be treated with caution. Although they can be a source of soundings, **they must not be used for disproving critical soundings** because of the following limitations:

- Surveys are often provided to hydrographic offices with little or no supporting information, making it impossible to know how the survey was conducted, eg the method of depth selection applied. However, if there is sufficient metadata, such surveys should be validated by a competent surveyor.

- Such surveys (including swathe surveys with apparently very dense datasets) are designed to meet the specification of the survey sponsor, which is unlikely to be in direct support of nautical charting. For example, a survey may have been processed to select the mean depth in any given area rather than the shoal-biased depth which would be selected in a hydrographic survey. Mean depth may give a much better 'image' of the sea floor, but filter out pinnacles.

Any caveats about a survey's reliability must be communicated to the chart user, eg through appropriate ZOC categorization or the source diagram. It must also be preserved in records for future use in generating charts, eg from a database.

B-611.3 **Information from other official authorities** not directly concerned with charting should normally be accepted for their particular responsibilities, eg lights data from national lighthouse authorities.

B-611.4 **Surveys and NM originated by local port authorities** should normally be accepted, if experience has demonstrated reliability.

B-611.5 **Imagery** derived from aerial photography and satellites is available from both official (eg land survey organizations) and commercial sources and can be a very valuable source of information. Its interpretation and application for charts requires particular expertise.

B-611.6 **NM originated by the national charting authority** for an area should normally be accepted (unless some anomaly is apparent, which should be resolved by correspondence with the relevant hydrographic office).

B-611.7 **NM originated by authorities concerning waters which are not their national charting responsibility** should not normally be acted upon without obtaining corroboration from the national charting authority, if there is one.

In certain circumstances, another hydrographic office may act as the 'primary' charting authority, eg where:

- there is no national hydrographic office; or
- where the responsible national agency, which does not itself produce charts, has agreed.

In such cases, NM issued by the primary charting hydrographic office in those waters may be regarded as authoritative.

B-611.8 **Information obtained from NC or NE** produced by another national hydrographic office for its own waters should be accepted (unless some anomaly is apparent, which must be resolved by correspondence with the relevant hydrographic office). Such charts should normally be examined for differences from existing charts as follows:

- Charts published by the national or primary charting authority, and INT charts published by the authorized producer nation, must be fully examined.
- In areas where there is no national or primary charting authority, all source charts should be examined.
- Charts which are derived, in part, from another nation's charts, should be examined only within the area for which the producer has primary responsibility, plus any international waters or where there are special circumstances (eg: there is no defined boundary, nations alternate surveying responsibilities in a river estuary).
- Charts which are wholly derived from another nation's charts should not normally be examined, unless there is a requirement based on knowledge of the particular area and of the source charts.

B-611.9 **Reports from ships** should not normally be accepted solely as the basis for permanent chart updates without corroboration unless:

- they originate from recognised survey vessels, research ships or other vessels/masters known to be reliable;
- they are reports of shoal depths, preferably accompanied by supporting evidence, eg an unambiguous echo-sounder trace, for areas where it is unlikely that corroboration can be obtained. The national or primary charting authority (see B-611.6) for the area should be consulted before NM action is taken;
- they are the sole source of information in a remote area;
- they are of particular significance to navigation;
- the location is in an area where the level of information flow and lines of communication are poor.

B-611.10 **Reports from private individuals** must be treated on their merits. For example, where the individual is a local resident of the area of the report, the information is likely to be useful, but should be forwarded to the primary charting authority for comment and/or confirmation.

B-611.11 **Publications such as port guides, that are not produced by hydrographic offices**, may contain useful, and occasionally significant, information. Experience will inform decisions on whether such material should be examined, and may depend on the level of information available from official sources.

B-611.12 **Notifications of works.** Confirmation of completion should normally be obtained before permanent action is taken on features such as cable-laying, planning consents and harbour works, as the finished works may not be exactly as planned. Such features may be covered in the interim by (P) NM action, and/or the use of legends such as 'Under construction', 'Being reclaimed' or 'Works in progress', with an associated date (see B-329). Confirmation is not normally required for lights and buoys administered by a national lights authority (unless announced some months in advance) or for superimposed limits (eg anchorages; fairways; fish farm licence areas) designated by a competent regulatory authority.

B-611.13 **The World Wide Web** contains both official and unofficial data and is a very valuable source of information. A careful assessment of its reliability must be made if it is to be used in nautical charts.

B-620 SELECTION CRITERIA FOR PROMULGATING INFORMATION VIA THE NOTICE TO MARINERS (NM) SYSTEM

B-620.1 The volume of new hydrographic information worldwide is considerable. Ideally, all permanent changes to charted information would be promulgated immediately, but in practice restraint must be exercised in the interests of producing a manageable updating system and, more importantly, to avoid overloading the paper chart user. If all the available information were promulgated immediately as updates to paper charts, the quantity and complexity would overload most users and limit the usefulness of these products. Strict control must therefore be exercised in selecting that which is necessary for immediate (ie by RNW, see B-601.8) or relatively rapid promulgation. That which is merely desirable should usually be recorded for including in the next edition of the appropriate chart(s). These judgements should be based on consistent criteria; an example of such a set of criteria is provided at B-620.3. Note: Different criteria may be developed for ENC updating, which is not subject to the same limitations.

Each item of new information received in a hydrographic office must be assessed for potential danger to life, vessels, property and the environment (ie how navigationally significant), bearing in mind the wide variety of users of charts in the area affected and the different emphases which those users place on the information contained in the products. For example, the master of a large merchant vessel may be far more concerned with information regarding traffic routes and deep water channels than the recreational user, who may in turn have a greater interest in shoaler areas where the merchantman would never intentionally venture. The fisherman and submariner may have a greater interest in hazards on the sea floor.

The aim is to keep charts up-to-date whilst keeping the foregoing firmly in mind. As far as possible, charts, both paper and electronic, should be safe, fit for purpose and consistent with associated publications which should be carried and consulted in accordance with carriage regulations and good practice.

B-620.2 **Priorities**. The following principles apply in deciding priorities for inserting information:

- Where differences exist between charts, the largest scale national and, where appropriate, INT chart is accepted as the authoritative document and must therefore be given priority for updating. Differences between charts and related publications may also need to be considered.
- The mariner may not always use or carry the largest scale chart available; however, he should always use the largest scale chart appropriate for his purpose and should also bear in mind that:
    - larger scale charts are generally updated first
    - detail in areas which are covered by larger scale charts may be generalized.
- Consideration must be given to the likely type of shipping using an area. For example, small changes in depths may be very significant in areas where deep-draught vessels operate with minimal under-keel clearance.
- Navigationally significant changes that occur when a New Edition (or New Chart) is within a few weeks of publication may be promulgated by a Preliminary (P) NM instead of chart-updating NM. The (P) NM should state that the changes will be included in the New Edition (or New Chart).

B-620.3 **Information considered to be navigationally significant**, listed below but not prioritized, should normally receive NM, NM block or LNE action, at least on the larger scale charts affected, including the largest scale INT chart for information relevant to international shipping:

a. **Reports of new dangers significant to surface navigation**, eg shoal depths and obstructions, including wrecks, with less than 31 metres of water over them if considered

to be dangerous to some surface vessels capable of navigating in the vicinity. The following is a general guide for changes in depths from 0 to 31 metres:

- depths 0 to 10 metres – critical and controlling depths (see NOTE) shoaler than charted by at least 0,5 metres (0,3 metres at berths);
- depths 10 to 31 metres – critical and controlling depths (see NOTE) shoaler than charted by at least 1 metre;
- changes to critical or controlling depths in high risk areas where vessels operate regularly with minimum under-keel clearance (eg Dover Strait TSS, Southern North Sea DW Routes, Malacca Strait) and within and adjacent to main channels in port areas and their approaches. In such areas, dangers which have been removed (eg wrecks) or conclusively disproved (eg controlling depths) should be deleted (navigators may otherwise try to avoid the non-existent danger, thereby putting themselves or others at risk);
- if the existence of a danger, which is charted as doubtful, is confirmed.

NOTE: the Hydrographic Dictionary (IHO S-32) contains the following definitions:

'**Controlling depth:** The least depth in the approach or channel to an area, such as a port or anchorage, governing the maximum draft of vessels that can enter.'

'**Critical sounding**: The least depth in proximity to a known or potential navigational route';

The key word in this application is 'potential'. Controlling depths in a defined channel are easy to recognise; the real skill comes in recognizing the critical depths in a wider area. In an uneven area, where there is no clear channel, it may be necessary to select the least depths over several high points, ie the 'critical depths'. Even where there is a clear ship channel, the cartographer needs to consider the needs of other vessels that may not be constrained by, and may even avoid, the ship channel.

b. **Changes in general charted depths significant to submarines, fishing vessels** (eg snagging trawl nets) **and other sub-surface operations** (depths to about 800 metres) including reports of new dangers and changes to least depths over underwater structures, eg wellheads, pipeline manifolds. The following is a general guide for changes in depths greater than 31 metres:

- 31 to 200 metres - new dangers and any critical depths shoaler than charted by approximately 5% or more;
- 200 to 800metres - new dangers and any critical depths shoaler than charted by approximately 10% or more;
- Insertions, deletions and amendments of reported and confirmed dangers and anomalous depths of less than 800 metres in ocean areas (see B-429);
- Obstructions, including wrecks, that might be the least depth in the general area;
- Obstructions, including wrecks, in anchorage areas, regardless of depth;
- All underwater production structures, regardless of depth, unless they are known to have been abandoned and cleared to the sea floor. (Some trawlers can operate at depths greater than 800m, and damage to oil and gas structures could have serious environmental consequences).

c. **Changes to aids to navigation**, e.g. lights, buoys in critical positions. The following is a general guide for changes:

- Insertion of new aid to navigation;

- Movement or deletion of existing aid to navigation;
- Significant change to light characteristic (ie character/rhythm, period, colour) of light/light-buoy;
- Addition of light sector or change to existing sector. The degree of change that warrants NM is dependent on the importance of the change, such as the proximity of a sector limit to a danger. The movement of the sector limit must be plottable by the chart user; this will depend on the scale of the chart and the range of light. This is unlikely to be less than 1° on long range lights and less than 3° on short range lights.
- Change to light range, depending on the amount of change and the significance and location of light. Generally issue by NM if range change is more than 5 miles;
- Change to height/elevation only if the change is significant;
- Changes in radio aids to navigation, eg new or moved radio reporting points and lines, new or changed AIS transmitters and radar beacons, and Vessel Traffic Services, including changes to names and limits.

For major changes to buoyage systems see B-621.

d. **New routeing measures** or changes to existing ones. Notification of the effective date needs to be considered, see B-621.

e. **Changes in restricted and regulated areas**, anchorages, etc.

f. **Works in progress** outside harbour areas where there is potential danger to navigation or it is adjacent to navigable channels.

g. **Structures at sea:** insertions or deletions of above water and surface structures at sea (eg platforms, wind turbines, wave farms).

h. **In harbour areas**: changes to wharves, reclaimed areas, depth, date and limits of dredged areas, works in progress and new ports/port developments (see also B-620.4).

i. **Cables and pipelines**: all overhead cables and pipelines (with vertical clearances); vulnerable (ie insufficiently buried, see B-443.8 and B-444.5) submarine cables and pipelines to a depth of 200 metres, although this should be flexible for some geographical areas where it is known that there is seabed activity at greater depths.

j. **Marine Farms** and other aquaculture structures which might be a danger to navigation. (Note: In areas where marine farms are constantly moving or being established, a general chart note may be more appropriate than constantly updating by NM).

k. **Landmarks:** insertions or deletions of conspicuous landmarks and landmarks assessed as being useful for navigation.

l. **Pilotage** services and pilot boarding places.

m. **Vertical clearances** (and in some cases horizontal clearances) of bridges and other overhead structures.

n. **Chart references.** References to adjoining and other scale charts when a NC (or NE with changed limits) is published, see B-635.2.

B-620.4 **In ports undergoing development**, the legend 'Port Development (see Note)', or equivalent, with an appropriately worded note, may be used to reduce the amount and frequency of NMs. The legend and note should be removed on completion of the development programme and replaced by the final details. Alternatively, a (P) NM and graphic may be issued (see B-634).

B-620.5 **Deletions**. When a feature is deleted, care must be taken to ensure that the deletion does not affect another item. In particular, whenever objects (eg beacons or lights on rocks or islets, wrecks on shoals) are deleted, the original surveys or other sources must be consulted to

determine whether any rock, islet or shoal sounding should be re-instated, light structure retained or new obstruction inserted. (Technical Resolutions F3.4, F3.10)

B-621 PROMULGATING MAJOR CHANGES IN ADVANCE OF IMPLEMENTATION, eg: NEW AND AMENDED ROUTEING MEASURES; MAJOR BUOYAGE SYSTEMS

The issue of a New Edition (NE) automatically cancels the existing chart. However, on occasions, it may be necessary to publish a NE of a paper chart, but still retain the old version for use or reference until a given date. These occasions may include changes to routeing measures or buoyage systems that are being promulgated in advance of the implementation date. In order not to have two charts with the same number, it is important to provide a means of distinguishing them (eg adding a prefix, such as 'X', to the number of the old edition). This process ensures that the mariner can continue to use (and if necessary, obtain) the existing paper chart (maintained by NM) prior to the changes and at the same time have available a NE of the chart for planning purposes and for use from the date of implementation.

To ensure that the user is given adequate notice of the changes due to come into force, the following procedures are recommended for paper charts, where NE/NC is necessary due to the extent of the changes. Because of the different systems available in ENC/ECDIS (eg Start and End dates, ability to roll the display back or forward in time) these procedures are designed specifically for paper charts. However, some of the actions do assist the ENC user and this is stated in the procedure.

B-621.1 As soon as the final details are known (~~which may be up to~~but not more than[colemana10] 6 months in advance of implementation ~~for IMO approved schemes~~), a Preliminary (P) NM (see B-634) should be issued for all charts affected, giving full details of the changes, the date of implementation, and plans for chart updating. A graphic showing the changes should normally be included. The requirement to include full details (including a comprehensive list of geographic positions) in the (P) NM is to ensure a back-up is provided in the event that the user fails to receive the New Editions of charts for whatever reason. The (P) NM should be cancelled shortly after the implementation date.

B-621.2 A chart-updating NM should also be issued, inserting a magenta legend on the existing chart adjacent to the area of change, indicating the change and implementation date and number of the (P) NM, eg:

CHANGES TO TSS TO BE
IMPLEMENTED ON 1 JULY 2008
(SEE NM 1586(P)/08)

This is important in order to draw the attention of users to major forthcoming changes. It provides the paper chart user with a reference to a (P) NM.

B-621.3 To allow adequate distribution time, a NE should be published 4 to 8 weeks before the implementation date of the changes (if possible) and should carry an appropriate caution in magenta within a prominent box (preferably located outside the top border of the chart so that, when removed, it does not leave a gap in chart detail). The boxed caution may be customised to suit individual circumstances, eg:

Boxed caution for NEs:

CAUTION – CHANGES TO THE [*name*] TRAFFIC SEPARATION SCHEME[ROUTEING MEASURES] -
NEED TO RETAIN PREVIOUS EDITION OF THIS CHART
The routeing information and associated buoyage shown on this chart incorporates the changes scheduled for implementation at [*time*] UTC [*date and year*]. The previous edition of this chart should continue to be used until these changes are implemented. The chart number of the previous edition (dated [day/month/year]) is to be changed to X----; it will be updated independently and cancelled shortly after the implementation date.

B-621.4 In the case of a NC which is published in advance of changes, there is no requirement to change the number of the existing chart (as the NC will have a different number), but the announcement should state 'Existing chart(s)…. should continue to be used until these changes are implemented', eg:

Boxed caution for NCs:

CAUTION – CHANGES TO THE [*name*] TRAFFIC SEPARATION SCHEME[ROUTEING MEASURES] -
NEED TO RETAIN CHARTS [1234, 2345 and 2346]
The routeing information and associated buoyage shown on this chart incorporates the changes scheduled for implementation at [*time*] UTC [*date and year*]. Existing charts [1234, 2345 and 2346] should continue to be used until these changes are implemented; they will be updated independently and cancelled shortly after the implementation date.

B-621.5 A legend stating the implementation date and referring to the Caution should be included on the NE or NC adjacent to the area of change, eg:

REVISED TRAFFIC SEPARATION SCHEME
TO BE IMPLEMENTED ON 1 JULY 2008
(SEE CAUTION)

B-621.6 It is necessary to explain to the mariner why two copies of the same paper chart are extant. An announcement should be included in the regular NM publication as a miscellaneous NM, see B-635.1. A copy of the caution should be inserted in the announcement of the NE with the advice that users wishing to order a copy of the old or new edition should quote the distinguishing chart numbers. The following example uses a practice that assigns an 'X' prefix to the existing edition:

CAUTION – NEW ROUTEING MEASURES -
NEED TO RETAIN PREVIOUS EDITION OF THIS CHART
The routeing information [and associated buoyage] shown on this chart incorporates the changes scheduled for implementation at 0000 UTC 1 July 2008. The previous edition of this chart should continue to be used until these changes are implemented.

Notes:
1. The chart number of the previous edition (dated [day/month/year]) is to be changed to X1234. It will be updated independently and cancelled shortly after the implementation date.

2: Chart X1234 should be added to the list of charts affected by Notice 1586(P)/08.

3: Copies of the existing chart can be obtained, until 1 July 2008, by ordering X1234.

Additional information may be added as appropriate for individual chart requirements. For a NC, the appropriate caution should be inserted in the NM announcement of the chart, but there will be no reference to any previous edition.

B-621.7 Until the implementation date, navigationally significant information must be promulgated for both the published NE and the previous version of the chart. Navigationally significant information may affect the charts in different ways, as the new routeing measures or buoyage system may not be the only changes included in the NE. When the changes have been implemented, the old version of the chart must be cancelled and any (T) or (P) NM which apply solely to the old version must also be cancelled. The boxed caution and '(SEE CAUTION)' legends on the NC or NE should also be removed by NM.

B-621.8 When a NE or NC promulgates a completely new TSS (or other routeing measure or buoyage system) that has not yet been implemented at the time of publication and there are no amendments to any existing TSS (or other routeing measure or buoyage system), the above procedure does not apply. Instead, as soon as the final details are known (but not more than[colemana11] 6 months in advance of implementation), a (P) NM, including a diagram, should be issued for the existing chart, giving full details of the changes, the date of implementation, and plans for chart updating. This is to ensure a back-up is provided in the event that the user fails to receive the new products (eg New Editions of charts, whether paper or ENC) for whatever reason. The NE or NC should be published 4 to 8 weeks before implementation (if possible). A legend should be inserted alongside the new TSS giving the date and time of implementation if still in the future at the time of publication, eg:

TRAFFIC SEPARATION SCHEME
(OFF CAPE PALOS)
TO BE IMPLEMENTED AT
0000 UTC, 1 JULY 2008

The (P) NM should be cancelled shortly after the implementation of the scheme. The legend should be removed from the chart at the next opportunity (eg reprint) or may be deleted by NM (to remove clutter from the chart).

B-630 THE NOTICE TO MARINERS SYSTEM

B-630.1 SOLAS Chapter V regulation 9 requires contracting governments to:

> 'promulgate notices to mariners in order that nautical charts and publications are kept, as far as possible, up to date'

SOLAS Chapter V regulation 27 states that:

> 'Nautical charts and nautical publications, such as sailing directions, lists of lights, notices to mariners, tide tables and all other nautical publications necessary for the intended voyage, shall be adequate and up to date'.

The Notice to Mariners (NM) system exists for this purpose. NMs are valid only until they are superseded by a New Edition (NE) or New Chart (NC).

Instructions for the permanent updating of another nation's nautical documents must not be issued by any country without the agreement of the originating State.

When a hydrographic office receives nautical information, assessed as being navigationally significant, regarding an area which it does not itself cover and for which its nationals use the charts and/or publications of another country, it must pass on such information as quickly as possible to the authority issuing the publications concerned. It may also issue a Preliminary NM ((P) NM) giving details of this information, including a reference to the foreign nautical documents affected, but without issuing instructions for their permanent updating.

B-630.2 **Reference to NM on charts.** Charts must state clearly on them (in the bottom left hand corner, outside the chart border – see B-252.3) to which NM they have been updated. If a hydrographic office produces a separate series of charts for the users of small craft, there is no requirement for it to incorporate NM updates between printings of these charts, but a warning should be inserted on them clearly stating that they have not been updated from Notices to Mariners (Technical Resolution B1.10).

B-630.3 **Periodicity and content of NM.** NM should be published as soon as possible, eg on the web. If printed paper NM booklets are issued, they should be issued regularly, eg weekly, fortnightly or monthly (Technical Resolution F1.7). Contents may include:

a) General explanatory notes about the NM system and contents of the booklet;

b) Announcements of the publication of NCs, NEs, other publications, cancellations of charts and consequential effects on remaining charts;

c) Chart-updating NM (with indexes arranged in NM and charts-affected order and regular recapitulative lists);

d) (T) and (P) NM (with lists of (T) and (P) NM in force or cancelled at regular intervals, see B-633.5 and B-634.7);

e) Updates to other publications (eg Sailing Directions, Lists of Lights & Fog Signals);

f) Radio Navigational Warnings in force.

B-630.4 **Arrangement of chart-updating NM.** The limits of oceans and seas described in IHO publication S-23 should be used as a basis for the geographical arrangement of NM editions. A geographical index and a numerical index of the charts affected should be given in each edition. The sequence in which the information is given should always be the same (although not all the following items may always be applicable), eg:

a) Number of NM (see B-630.5).

b) General region (normally one of the following categories): Ocean/Sea or Country

name (see B-631.3).

c) Sub-region (eg coast, gulf, island, river).

d) Specific location (eg port name, terminal).

e) Subject (eg lights, depths).

f) Lights List numbers (if applicable – see B-631.7).

g) Authority (ie original source upon which the NM is based – see B-631.6).

h) Amplifying remarks, including cancellations of (P) & (T) NMs (if required – see B-631.8).

i) Chart(s) affected (see B-631.7). (Publications affected, if applicable).

j) To enable the chart updater to ensure no NM has been missed, a reference to the preceding NM number may be required (see B-631.7).

k) Horizontal datum (if considered necessary - see B-631.7).

l) Date of establishment, alteration, etc. (eg the implementation date of a routeing measure).

m) Detailed description (using INT1 as a guide – see B631.4).

n) Position (see B-631.5).

(Technical Resolutions F2.1, 2.2, 2.3, 2.4)

B-630.5 **Numbering.** A standard method of numbering notices should be adopted, the arrangement being a unique and sequential number of NM/Year of publication, eg NM1234/09 (Technical Resolution F2.5). (T) or (P) ~~should~~ must [colemana12]be added~~, if appropriate~~ for temporary or preliminary NMs, eg NM1234(P)/09. Additional elements may be added to the NM number, eg the national chart number, a sequential number of the update for each chart, the periodical number of the NM booklet. For example, the NM number may comprise the NM periodical number and chart number which, together with the year of publication, forms a unique, sequential number[colemana13], eg 36/413/2009 [periodical/chart/year]. If this system is used, it would be normal to group all updates for one chart under the same unique NM number.

[colemana14]**B-630.6 Recapitulative lists.** Every three to six months, Hydrographic Offices should publish (in paper form and/or on the web) recapitulative (cumulative) lists of NMs issued in that particular period, listed for each chart in numerical order. NMs which are no longer effective (ie, those replaced by other NMs, those referring to charts of which NEs have been issued, temporary NMs no longer in force, etc.) should not be included.

These recapitulative lists should be combined at the end of each year in an annual list drawn up in the numerical order of the charts. (Technical Resolution F2.3)

B-630.7 **Early exchange of NMs**. A hydrographic office should, immediately upon publication of its NMs, send or make available a copy to those hydrographic offices requiring copies by the quickest possible method, eg email. (from Technical Resolution F4.5)

B-631 CHART-UPDATING NOTICES TO MARINERS: TEXTUAL

B-631.1 **A textual chart-updating NM** is the quickest means of permanently updating a chart for navigationally significant information (see B-620 to B-623). It must include clear, concise and unambiguous instructions to enable the user to update his charts and may include printed chart symbols or other small graphics to assist manual updating. NMs must always be drafted to update the fully-maintained chart (ie with all previous NMs applied).

B-631.2 **Limitations.** It is important to avoid overburdening the chart corrector and to assist him in accurately applying the update. The number of positions to be plotted should therefore be

limited. Generally not more than 10 points should require to be plotted, but each case should be assessed on its merits (see B-632.5). Alternative methods, eg a graphical NM (see B-632.1) or LNE may be more appropriate if:

- there is a large amount of navigationally significant information;
- the area concerned has already been subject to considerable updating and may therefore become unreadable on users' charts when manually updated;
- the complexity of the change, particularly in a small area of the chart, makes clear manual plotting difficult.

B-631.3 **Title.** The NM should be given a title which will assist the mariner in identifying the geographical location and then where on the chart the update is located. It is therefore normal to start the title with the country name (except in international waters, where the ocean or sea name should be used), followed by any sub-region, local names and a general indication of the nature of the update, eg:

> NEW ZEALAND – North Island – West coast – North Taranaki Bight – Marine reserve. Buoyage.

Names should be in agreement with the largest scale chart. There will often be a choice of region between the relevant country and its adjacent sea or ocean; whenever possible use the country name, particularly in coastal waters.

B-631.4 **Text.** As English is the accepted international language for navigational purposes (see B-510.4), text should be given in English in addition to the national language. A glossary may be used. Instructions must be free from ambiguity and for ease of understanding a standard set of terms must be used to instruct the user. The following are the English language terms which should be used, other language equivalents may be used as appropriate:

- 'Insert [feature] [position]'. Used for the addition of new information: either a new feature or a new characteristic at an existing feature (eg adding an AIS to an existing buoy).
- 'Delete [feature] [position]'. Used for the removal of existing charted details. (Note: the alternative term 'remove' may be confused with 'move', see below)
- 'Amend [characteristic of feature] to [new characteristic] [position]'. Used to change a characteristic of an existing charted feature when its position has not changed.
- 'Replace [feature] with [new feature] [position]'. Used when a feature replaces a different feature in the same position. (Note: the former use by some HOs of the term 'substitute' has the potential to be ambiguous in its application).
- 'Move[colemana15] [feature] from [position] to [position]'. Used when a point feature has moved a short distance, but the associated details are unchanged. If the distance of the move is greater than about 30mm, it may be better to use 'insert' and 'delete'.

If possible, it is better to portray the actual chart [colemana16]symbol in the NM. Alternatively, symbols may be described, ideally by the term used in INT1, together with the INT1 number to assist the user in identifying the correct symbol to be inserted or deleted, etc.

B-631.5 **Positions.** In general, for deletions, amendments or replacements, quoted positions do not need to be quite so precise as for insertions and moves, provided the mariner is left in no doubt as to which feature the NM refers. Positions can be quoted by one of three methods:

a. **Latitude/Longitude.**

Precision of positions for inserting or moving detail should be as follows:

Scales of 1:25 000 and larger	3 decimal places (dp) of minutes (eg 0,001')
Scales between 1:25 000 and 250 000 (see notes)	2 dp of minutes (eg 0,01')
Scales of 1:250 000 and smaller (see notes)	1 dp of minutes (eg 0,1')

Notes:

Exceptionally, on charts for which the graduation does not support positions given in decimals of minutes, positions should be quoted to the nearest second (or dp of a second if necessary).

The NM author should bear in mind the user's maximum hand-plotting precision on paper charts of 0.3mm (see B-202.2) and judge whether 1 or 2 dp of a minute is required. It is difficult to give definitive guidance for the limiting scale between 2 dp and 1dp as the length of a graduation division depends on scale and the properties of the projection. In general, it would be unusual to quote the position to only 1 decimal place for insertion of new features on charts of a larger scale than 1:250 000.

When deleting point features, unless there may be ambiguity with adjacent features, it is usually adequate to quote to just one or two dp depending upon the scale of the chart.

Where a geographical position coincides with existing chart detail or the chart border, then reference to this should be given to provide confirmation to the user, eg:

- 44°29,584'N 12°17,090'E (shore)
- 34°38,400'N 135°08,675'E (seaward end of breakwater)
- 51°23,065'N 0°31,230'E (E border)

See B-131 for format for expressing geographical positions.

b. **Bearing and distance from a reference point**

This should only be used where the chart or plan to be updated carries no graduation. The reference point must be identified clearly and unambiguously, eg: 'Chimney, centre of E border'; 'Light, centre left of plan'.

List insertions in the sequence of their bearing from the reference point.

Quote the bearing to a precision that will define the position of the insertion within the plottable error (0.3mm), ie degrees and decimals (depending on the length of the line of bearing).

Distances should be given in nautical miles or metres, depending on the scale of the chart or plan and the availability of linear scales (see B-220).

c. **Reference to a feature previously quoted in the NM**

A position can be described in relation to a feature already quoted in the NM. Generally, positions should have a letter identifier when that position is referenced by another part of the NM relating to that chart, eg:

- Insert legend, *Gas (see Note)*, along pipeline at (a)-(b) above
- Delete depth *75* , close W of (c) above

B-631.6 **Authority**. The NM should include an acknowledgment of the source of the information, eg:

- a 'Government survey';
- a Foreign Government Chart (the number and edition should be quoted);
- a Foreign Government NM (the number and year should be quoted);
- the name of an authority, vessel or person who sent a report.

Every NM which is from an original source (ie not previously published by another national hydrographic office) should be marked with an asterisk so that they may be readily distinguished from those which are reproduced from foreign NMs. (Technical Resolutions F3.1, 3.2, 3.12).

B-631.7 **Chart(s) affected.** One numbered NM should be issued for a particular subject, so that the chart user has all aspects of the change provided in one place. There are two principal conventional methods of arranging a NM. The first one reduces the possibility of confusion and is therefore preferred:

- a separate entry for each chart affected, with the national (and INT) chart number preceding the entry.
- a single entry covering all charts affected, with the national (and INT) number of the charts listed at the end of the NM. If this method is used, it must be made clear which parts of the NM affect each chart, eg where the different scales need updating differently, the positions differ because of different datums used.

Within the individual NM, the chart numbers must be listed in either numerical order or descending scale order. Whichever order is chosen, it must be applied consistently.

It is important that the chart updater can ensure that the previous NM has not been missed. If the numbering system does not use sequential numbers for each chart, a reference to the preceding NM number (or chart edition date if this is the first NM) should be added in brackets after the chart number.

The horizontal datum to which each chart is referred may also be given; this is useful if there is any need to plot the information onto other maps or charts.

If the update affects a light, the international number (or national number if there is no international number) should be quoted. (Technical Resolution F3.3).

B-631.8 **Amplifying notes.** These are notes to the mariner to be included in the NM which are used to provide additional information. They may be used to indicate that the contents of the NM will be included in a forthcoming NC or NE, that the NM cancels a former Preliminary or Temporary NM, or it is intended to issue a further NM if additional information is expected, or it is known that there will be more developments. (Technical Resolution F3.8) eg:

- Note: This update will be included in a New Edition of Chart 591 to be published 24 January 2010.
- Note: Former NM 2457(T)/09 is cancelled.
- Note: This change is effective from 22 February 2009.
- Note: Chart 591 is to be deleted from the list of charts affected by NM 2547(T)/09.
- Note: A further NM will be issued when full details are received.

An amplifying note should also be used to indicate when a NM is relevant for ‘Certain copies only’. This is used when there has been an error in the text of the original NM but not on printed copies subsequently distributed, or vice versa.

B-631.9 A tracing showing the chart update may be produced and distributed to chart users as an aid to plotting the NM. A tracing is produced for guidance only; the textual NM is the published authority.[colemana17]

B-632 CHART-UPDATING NOTICES TO MARINERS: GRAPHICAL

B-632.1 **A graphical chart-updating NM** (subsequently referred to as a **block**; also sometimes called **chartlet** or **patch**) is an updated portion of a chart containing new or revised information in a particular area. The user can stick it on the chart, to cover obsolete details. The purpose of a block is to promulgate a significant amount of new safety-related data in a relatively small area. It must be used where the complexity or volume of changes would clutter the chart unacceptably if amended by hand or would overburden the chart corrector, thereby compromising its safe application.

B-632.2 A NM block must be announced by a textual[colemana18] NM. This should include the approximate position and indicate what features the block is updating, eg:

> Insert the accompanying block, showing amendments to depths and contours, centred on: 11°57,0′N 16°09,5′W

The textual NM also provides the number, title, etc; see B-630.4.

B-632.3 **Mentions**. The ~~accompanying~~ textual NM announcing the block may include further chart-updating details, sometimes called 'mentions', which update the same chart as the block but fall outside the limits of the block. The use of mentions is a matter of judgement; for example:

- ~~For example,~~ the block size may be reduced by providing details of simple linear features (such as light sectors or leading lines) to be plotted by the user~~manually updated~~, which would otherwise necessitate a much larger block.;
- an increase in block size may be appropriate to avoid the user plotting more complex updates.

B-632.4 Due to the possible extended timescale involved in preparing a block, consideration should be given to issuing a Radio Navigational Warning (see B601.8) or a chart-updating NM (see B-631) ahead of the block for the most significant safety-related items. Alternatively, a Preliminary NM may be issued to describe the changes in general terms, see B-634.

B-632.5 A general guide is that a textual NM may be issued where there are fewer than 10 points to be plotted. If there are more than 10 points, then a block (or possibly LNE, see B-601.5) should be considered. However, if the items to be updated are point symbols (eg depths or lights) spread throughout the chart, then a textual NM may still be appropriate even if there are more than 10 points to be plotted. Conversely a block may be appropriate when there are fewer than 10 points to be plotted where:

- the points are in a very small area, ie the update would need to be applied very neatly to be clear;
- there are complex line features that cannot be described clearly by text, eg irregularly shaped depth contours or area limits, navigationally significant changes to coastline;
- there are insertions and deletions of line features in close proximity, eg where there are small changes to light sectors or a leading line, such that the detail may not be entirely clear when the update has been carried out;
- new limits of significant areas are being inserted and the old limits deleted, with a result that there could be confusion over what remains in force;
- there are changes to points that have been previously updated, ie there would be manual updates to previous manual updates, which could be confusing for the chart user;
- a new or revised chart note is required;
- a detailed table needs updating, eg channel or dredged area depth tables.

B-632.6 **Size and fitting of NM blocks**

The following guidance should be considered when constructing NM blocks:

a. Large size or folded blocks can cause considerable problems in fitting accurately to the chart, because of eg: paper stretch, wrinkling, misalignment; they are therefore unpopular with chart users. They should only be used where there are clear grounds for rejecting the alternative of a LNE. A large block can sometimes be avoided by using 'mentions' (see B-632.3).

b. The dimensions of a block should ideally be up to about 185mm x 130mm, which conveniently allows two blocks per A4 page and also ensures the digital file size is small enough to be easily downloaded from a website.

c. For convenience and ease of use a block should not be smaller than 45mm x 35mm.

d. A minimum margin of 5mm is needed within the block around all new and deleted work. This allows for inaccuracies in cutting out.

e. A block must extend beyond the limits of a previous block in the same area on at least one side to facilitate accurate fitting.

f. Sufficient detail must occur at the edges of a block to facilitate accurate fitting to the chart. A meridian, parallel or legend running across the edge of a block helps the chart updater.

g. Block limits should be designed if possible to avoid:

- cutting through or close to important point information such as wrecks, rocks, navigational aids;
- compass roses and scales (a block may be made five-sided to achieve this);
- folds in charts.

B-633 TEMPORARY NOTICES TO MARINERS

B-633.1 A Temporary (T) NM is used to promulgate navigationally significant information that will remain valid only for a limited period, eg:

- temporary oceanographic buoys;
- temporary changes in aids to navigation;,
- temporary changes to authorized draughts;
- hazards of a temporary nature such as naval operations, exploratory drilling or salvage operations;
- withdrawal or re-instatement of buoys at the close or beginning of the navigation season).

The convention is for the mariner to insert the update on his paper chart in pencil, and erase it when the (T) NM is cancelled. ~~In order for this information to be included in ENC, some form of geo-referencing must be included (as precisely as the data allows and must include at least one position and the datum).~~[colemana19]

B-633.2 The NM number for a (T) NM ~~should~~ must be followed by '(T)', before the year date. The specifications at B-631.3 (Title), B-631.5 (Positions), B-631.6 (Authority) & B-631.7 (Charts affected) also apply to (T) NM.

B-633.3 A (T) NM must not be initiated if the information will no longer be valid by the time the NM is likely to be received by the mariner; this will depend upon the distribution time span for NMs. Shorter time periods may be covered by Radio Navigational Warnings (see B-601.8). The maximum duration for a (T) NM to be in force should usually be no more than 12

months; if likely to be longer, a chart-updating NM should be issued. If possible, the (T) NM should include an indication of how long it is to remain in force.

B-633.4 (T) NMs in force should be reviewed regularly to consider whether further information can be acquired and whether they should be cancelled, updated or reissued, or replaced by permanent chart-updating NM. It is very important to ensure that mariners (and other hydrographic offices who chart the area) are aware when (T) NMs are cancelled. If a (T) NM is replaced by a chart-updating NM, that NM should state that the (T) NM is cancelled.

B-633.5 The publishing hydrographic office must issue regular lists of (T) NM which are still in force.

- Offices which publish a weekly edition of NM should issue such a list each month.
- Offices which publish a fortnightly edition of NM should issue such a list four times a year or more frequently, if desired.
- Offices which publish a monthly edition of NM must issue such a list at the beginning of every year or more frequently, if desired.

(Technical Resolution F3.7(1))

B-633.6 A (T) NM should not be issued if it is unlikely that the hydrographic office will be informed when the temporary situation has reverted to the charted state. Without such information, the (T) NM cannot be cancelled at the appropriate time. If possible, an alternative method of promulgation should be used, such as a general chart note, eg:

Aids to Navigation

The aids to navigation on this chart are reported to be unreliable….

B-634 PRELIMINARY NOTICES TO MARINERS

B-634.1 A Preliminary (P) NM is issued to promulgate navigationally significant data early to the mariner when:

- Action/work will shortly be taking place (eg harbour developments; installation of, or alterations to, important navigational aids). If possible, at least 8 weeks notice should be given, with the date of entry into force indicated (Technical resolution F3.5).
- Information has been received, but is too complex or extensive to be promulgated by chart-updating NM. A précis of the overall changes, together with detailed navigationally significant information, should be provided in the (P) NM, with a statement that full details will be included in a New Chart or New Edition to be published shortly (a date or timescale for the NC/NE should be given, if possible).
- Further confirmation of details is needed. A chart-updating NM should be promulgated, or NE issued, when the details have been confirmed. Where extended drying areas affect territorial or fishing limits, (P) NM action may be required until they have been confirmed by an appropriate legal authority.
- For ongoing and changeable situations such as a bridge construction across a major waterway. The (P) NM can be revised and reissued for updates (including diagrams if useful) as work progresses. A chart-updating NM should be promulgated, or NE issued, when the work is complete.

The convention is for the mariner to insert the update on his paper chart in pencil, and erase it when the (P) NM is cancelled. [colemana20] ~~In order for this information to be included in ENC, some form of geo-referencing must be included (as precisely as the data allows and must include at least one position and the datum).~~

B-634.2 The NM number for a (P) NM ~~should~~ must be followed by '(P)', before the year date. The specifications at B-631.3 (Title), B-631.5 (Positions), B-631.6 (Authority) & B-631.7 (Charts affected) also apply to (P) NM.

B-634.3 A (P) NM should give an indication of when the information will be included on the appropriate chart. If this is known it should be stated, eg:

- 'These changes will be included in a New Edition of Chart 1234 to be published in March 2010'.

Or, if the date for inclusion in the chart is unknown:

- 'These changes will be included in the next New Edition of Chart 1234'.

Where a particular date is specified, the (P) NM should be monitored and if it appears that the publication date mentioned is going to be missed, then consideration should be given to reissuing the (P) NM with a revised date.

Instead of issuing a (P) NM, consideration should be given to issuing a chart-updating NM inserting a 'Works in progress' legend on the face of the chart, e.g. 'Bridge under construction (2009)'.

B-634.4 **In addition to a (P) NM**, it may also be appropriate, where there are major changes, to issue a chart-updating NM inserting a legend, in magenta, on the face of the chart, referring to the (P) NM, eg:

- *See NM1234(P)/09*;
- *Shoal Depths (see NM2345(P)/09)*.

B-634.5 **Diagrams** to support (P) NMs are very useful to the mariner, eg:

- where a new, amended or complex series of routeing measures is being announced;
- a new bridge is being constructed and shipping routes need to be diverted.

Diagrams should be a different scale from the chart, to prevent the mariner from using them as blocks to directly amend the chart. If a diagram is at the same scale as the chart, it must contain a 'Not to be pasted on the chart', or equivalent legend.

It may be best to produce such diagrams in monochrome, using black stipple in lieu of tints if necessary, because:

- digital file sizes may be an issue for receipt by some users;
- the recipient may not be able to reproduce colours.

B-634.6 (P) NM in force should be reviewed regularly to consider whether they should be cancelled, updated or reissued, or replaced by permanent chart-updating NM. It is very important to ensure that mariners (and other hydrographic offices who chart the area) are aware when (P) NMs are cancelled. If a (P) NM is replaced by a chart-updating NM, that NM should state that the (P) NM is cancelled. If a (P) NM is cancelled on publication of a NC or NE, the announcement of the NC or NE should state that the (P) NM is cancelled (or that the chart should be removed from the list of charts affected by the (P) NM if it remains in force for other charts).

B-634.7 The publishing hydrographic office must issue regular lists of (P) NM which are still in force.

- Offices which publish a weekly edition of NM should issue such a list each month.
- Offices which publish a fortnightly edition of NM should issue such a list four times a year or more frequently, if desired.
- Offices which publish a monthly edition of NM must issue such a list at the beginning of every year or more frequently, if desired.

(Technical Resolution F3.7(1))

B-635 MISCELLANEOUS NOTICES TO MARINERS

B-635.1 Miscellaneous NMs are issued to promulgate important new information of significance to the mariner which is not otherwise presented on charts, eg:

- publication or cancellation of new nautical products or new editions of nautical products (see B-635.2);
- changes to information incorporated in General/Annual NMs (see B-636);
- general national or international maritime information, eg notification of incidents of piracy;
- changes to navigation services, eg changed contact details for VTS or pilot services.

[colemana21]**B-635.2 Notification of chart publications.** Chart users, distributors and others must be advised when a hydrographic office decides to publish a New Chart (NC), a New Edition (NE) of an existing chart, or to cancel an existing chart. (Technical Resolutions A3.1[colemana22] & F3.15). This should be announced in a publications list in Notices to Mariners, in two stages:

a. **An advance notification**, which should indicate the approximate date of publication and availability (or cancellation as appropriate).

The following information may be included in this notification, as appropriate:

- chart number;
- chart title;
- a brief statement of:
  - the main changes (for a NE, including whether only certain details have been updated, ie it is a LNE, see B-601.5),
  - its purpose (for a NC),
  - the reason (for a cancellation without replacement);
- whether the chart includes any changes which come into force on a particular date (eg revised routeing measures, new buoyage system);
- the horizontal and/or vertical datum (if changed from the previous edition);
- the scale and limits (for a NC, or NE with changed scale or limits);
- titles, scales and limits of new plans (or of plans cancelled);
- whether the chart is in the International Chart Series;
- an acknowledgment of the producer for an adopted chart;

b. **A final notification** must be made when the NC or NE is published and available (or finally cancelled, as appropriate). The fullest details from the above list should be included, as appropriate. Additionally, this notification should include whether there are any (T) or (P) NM which remain in force or should be cancelled on publication.

B-635.3 **Changes to chart references and limits.** As a consequence of publishing a NC (or NE with changed limits), changes to the references to this chart on adjoining charts and limits on smaller scale charts should be considered for updating by NM when the NC (or NE with changed limits) is published. This is to ensure that the mariner is kept up-to-date for the latest available chart coverage (which may not be in the chart catalogue).

B-635.4 Forms (and user instructions) should be provided by hydrographic offices in their regular NM editions and/or a reference should be made to the availability of a web-based form. This is to encourage mariners to report any observed changes needed to any charts and publications which they have used, by the quickest possible method. (Technical Resolution A1.15).

Instructions for the user (Technical Resolution F4.1) should include:

- for a sounding which appears abnormal and may indicate the possible presence of a danger to surface navigation, every effort should be made to confirm its position by as accurate a means as possible (eg a GPS position);
- a check of the depth should be made by means of a lead line if possible;
- when reporting such abnormal depths to the hydrographic office concerned, the following should be provided:

  i) Depth measured; date and time of day.
  ii) Position (with statement of how it was determined).
  iii) Make and type of echo sounder used and details of the speed of sound for which the machine was calibrated.
  iv) Result of checking by lead line, if any.
  v) The actual echo sounder recording (fully annotated) and a cutting from the chart with navigation fixes, etc marked on it, should be attached.

Hydrographic offices which receive information relating to waters for which another hydrographic office has the primary responsibility, should forward a copy to that office by the quickest possible method. In cases of immediate action being required, a RNW should be issued by the original hydrographic office (Technical Resolution A1.15). See also B-611.6.

B-636 GENERAL NOTICES TO MARINERS

The term ‘General Notices’ applies to all information and instructions that hydrographic offices may wish to bring to the attention of mariners but the nature of which is such that they may not refer to any specific nautical document. Such NMs might cover, for instance, various types of nautical information, distribution and upkeep of nautical documents, safety of navigation and protection of human life at sea, provision for assistance to vessels in distress, communications, dates of application of daylight saving time, etc.

Notices of this type are usefully repeated periodically, often unchanged. A practice of many hydrographic offices is to include them in the first periodical issue of NM of each year (and are therefore sometimes referred to as Annual Notices to Mariners). New, altered, or deleted material in such General Notices should be indicated by means of sidelines in the margin of the page, to assist the reader in identifying changes. English translations of General Notices of interest to foreign mariners should be issued by hydrographic offices simultaneously with those in their national language (Technical Resolution F1.1, F3.14).

B-640 CHART RECORDS

As stated at B-621, not all newly received information can be, or justifies being immediately included in charts. It is therefore necessary to record information which may be included on charts at a later date (usually at the next full NE). Hydrographic offices must develop and maintain appropriate mechanisms for recording and archiving such source data. In this specification:

- Recording is the method by which the information is recorded to ensure it is readily identified and not overlooked when a NE of a chart is prepared.

- Archiving refers to the method of storing source documents in a system which protects the documents and makes them accessible for retrieval.

Hydrographic offices need to consider carefully how long source documents should be retained, as they may form part of an audit trail in the event of an incident. Archiving is not considered further in this specification.

B-641 RECORDING OUTSTANDING INFORMATION

The method used for recording outstanding information may be one of the following.

B-641.1 **A Geographic Information Systems (GIS) Database** is an electronic method of storing all validated and relevant geospatial information and associated metadata. Such a database can be maintained up to date, so that a NE of a chart can be generated relatively quickly without recourse to the original documents. Carefully managed, such databases can reflect the 'real world' for all relevant hydrographic information required to produce charts and other products in different formats (eg paper, ENC) and at different scales with reduced final manual intervention in the production process.

B-641.2 **'Running compilations'.** These are compilations which run for the whole time between editions, so that at any time, it is comparatively easy to produce the NE when it is decided the amount of change justifies it. The disadvantage is that some detail may have to be reworked to make way for newer information before it is published, thus resulting in nugatory effort. They may be in analogue or digital form, depending on the compilation system being used in the hydrographic office.

B-641.3 **'Standard' or 'Pattern' copies.** These are printed copies of current charts, marked up to show the outstanding information in some detail. This enables work done during assessment of data to be transferred to the standard in a way which will provide some impression of the amount and significance of data outstanding. However, it is more time consuming and on 'busy' charts it may get confusing as some outstanding data is replaced by newer data. An alternative is to hold assessment work as a series of overlays to the standard.

B-641.4 **Manuscript lists.** These may be used to record both the data (with some unique identifier to facilitate retrieval from the archive) and a summary of the differences identified in the area of a chart. This is simple to administer, but has the disadvantage of giving little impression of how out-of-date a chart's depiction may have become.

B-642 RECORDING DECISIONS

In a period of increasing litigation, hydrographic offices may consider it sensible to carefully record decisions they make about the use of received information, in particular when any information is rejected for chart use or for immediate action. The following is intended as guidance for hydrographic offices that do consider such recording to be useful. However, it is not intended by the IHO that this guidance should be relied on by hydrographic offices as being a way of avoiding possible litigation against them.

Evidence of decisions to use information will be obvious – the information will be on the chart(s) or in the publication(s) that are published. In many cases decisions not to use received information are straightforward and may be recorded simply: eg 'scale too small', 'off chart limits', 'time-expired', 'does not meet NM criteria' (see B-620). In other cases, where decisions are more difficult and professional judgment is called for, it could be important to state clearly why the decision was reached and note the name and position/rank of the decision maker(s).

It is obviously necessary that a system, whether manuscript or electronic, must exist to record such decisions. In establishing such a system it is sensible to ensure that it, or a related system, is capable of easy retrieval of recorded decisions. Supporting documents (eg the

original source, correspondence with the source authority, copies of NMs issued) can be held with the record of decisions or be cross referenced to them, to provide an easy method of assembling all material evidence.