

Note: Paper heading/title and general format will be changed to conform to accepted IHO principles once content agreed.

1. Aim and Purpose

- 1.1. The aim and purpose of this paper is to help achieve a Worldwide ENC Database (WEND) by considering the key roles of the IHO and the Regional ENC Coordinating Centres (RENCs) in the WEND and proposing that the RENCs, as a fundamental and underpinning element of the WEND, are governed (but not necessarily operated) by the IHO Member States.

2. Introduction

- 2.1. The concept of establishing a WEND is set out in IHO Resolution 1/1997 as amended.
- 2.2. The WEND concept has been repeatedly endorsed by IHO Member States since 1997 through various revisions and improvements to the Resolution and through other declarations made at International Hydrographic Conferences and meetings of the relevant bodies of the Organization.
- 2.3. The principle purpose of the WEND is to provide a single database of standardised, validated ENCs that can be made available to end-users through any recognised distributor. The RENCs provide three key functions in the WEND:
 - 2.3.1. to conduct systematic and standardised validation checks on ENCs being included in the WEND, so as to ensure consistency and reliability of performance when used in ECDIS,
 - 2.3.2. to create, manage and maintain a virtual database of validated ENCs, that is, in effect, the WEND, and
 - 2.3.3. to act as a one-stop wholesaling agency for the provision of ENCs to distributors on behalf of contributing member States.
- 2.4. By 2013, 16 years after the concept of WEND was agreed, xx of yy States that produce ENCs make them available to the WEND through RENCs. Not all of those States make all of their ENCs available, some of those States do not use the available services of the RENCs to independently validate their ENCs.
- 2.5. For the IHO to achieve the aims set out in IHO Resolution 1/1997 as amended, all ENCs should be available through the WEND. This does not preclude or prevent ENC producers from implementing additional validation and distribution mechanisms.
- 2.6. Considering that the WEND is an IHO concept, and RENCs are a fundamental element in its achievement, this paper proposes, as a logical consequence, that the IHO should exercise an overarching governance role on the principles under which RENCs operate and deal with the ENCs provided by each contributing State in a RENC.

3. General Principles

- 3.1. The remainder of this paper proposes a set of operating principles under which current and future RENCs would operate, and places these organisations within the IHO structure, under an overarching IHO Board of Management.
- 3.2. It is proposed that this could be achieved through the establishment of an IHO-WENC Management Board. This Board would then ensure that all RENCs operate to a set of minimum requirements by providing guidance, direction and an independent auditing function. The Board would require RENCs to operate openly and transparently and provide a structure for RENCs to share best operational practices.
- 3.3. The role of the IHO-WENC Management Board is not intended to assume the management and governance of each RENC, which would continue to be exercised by those States belonging to each RENC, as is the case now. Each RENC and each HO would still be free to develop services beyond the minimum requirements, so as to meet the specific needs of HOs or regions.
- 3.4. At the same time, each RENC would operate according to an IHO endorsed set of minimum performance and operating requirements. These requirements focus on RENCs providing advice, guidance, knowledge and assistance to HOs and RHCs. This is expected to improve ENC quality, consistency and availability, while maintaining the RENCs' financial independence and existing governance board arrangements.
- 3.5. The inclusion of the RENCs as an integral part of the IHO structure, governed (but not operated) by the IHO would make all Member States direct stakeholders in the WEND and the performance of the WEND and the RENCs. This, in turn, may help to encourage all ENC producer States to contribute their ENCs to the WEND.
- 3.6. Overarching IHO governance of the WEND and RENCs will improve ENCs and ENC services for the mariner by:
 - Ensuring a minimum quality level for all ENCs that are subject to the standardised RENC quality assurance processes
 - Through consistent feedback and advice from the RENCs, enable HOs to meet the required levels of ENC quality and consistency that are demanded by the relevant IHO standards
 - Increasing the number and coverage of ENCs subject to the RENC process

4. Operating Principles for IHO RENCs

- 4.1. The following section describes the minimum standard operating principles under which each of the RENCs that collectively form the IHO-WENC, will operate. Neither the IHO nor the RENCs will have any influence on the national ownership of ENCs.
- 4.2. Notably, the RENCs that collectively form the IHO-WENC:
 - will not take ownership of ENCs
 - will not edit or change the content of ENCs

- will not enforce geographic coverage responsibilities on contributing HOs/nations.
- 4.3. As part of the IHO structure, all participating RENCs will:
- 4.3.1. Carry out checks to ensure that submitted ENC adhere to IHO ENC standards and producing guidelines (See IHO ENC&ECDIS web pages), namely:
- S-57 IHO Transfer Standard for Digital Hydrographic Data
 - S-58 Recommended ENC Validation Checks
 - S-65 ENCs: Production, Maintenance and Distribution Guidance
- 4.3.2. Test and report back to submitting HOs on ENC usability in ECDIS and compliance with relevant IMO SN Circulars., ECDIS performance standards and software. The purpose is to provide guidance to focus HO efforts on improving the ENC user experience.
- 4.3.3. Assist HOs and Regional International Charting Coordination WGs within and across RHCs as appropriate to achieve seamless ENC coverage (Reference: IHO S-11, Part A, Annex C), by:
- identifying gaps and overlaps for resolution by relevant HOs (with support from Regional International Charting Coordination WGs, if required. Reference: WENDWG3-4A, section 1.6 and 1.7)
 - advising relevant HOs on the alignment of ENC data (at edges of ENCs and between ENC scales) for resolution by the relevant HOs (through bilateral arrangements and Regional International Charting Coordination WGs recommendations, if required)
- 4.3.4. Encourage participating HOs to develop ENCs, and maintain ENCs once issued (in accordance with current ENC product standards)
- 4.4. RENCs that are part of the IHO-WENC will be expected to treat all participating HOs equally and impartially (including the States that host RENC offices), and to operate under the clear and transparent policies for the IHO-WENC adopted by the IHO. RENCs will be audited against these policies regularly by the IHO-WENC Management Board.
- 4.5. Response times and release of ENC data by participating RENCs will be in accordance with individual RENC policies, dictated by the requirements of their contributing HOs.
- 4.6. If any ENC data issue cannot be resolved between a participating RENC and an HO (or HOs), then:
- In the first instance, the HO, or the RENC, should ask for guidance from the Regional International Charting Coordination WG (Reference: WENDWG3-4A.)

- If a resolution is not forthcoming, the HO, or the REnc, should then ask for guidance from the IHO-WENC Management Board, which may consult with the relevant RHC Chair if required.
- 4.7. REncs will make publicly available the catalogue of their ENC database and will take the appropriate measures to provide the IHO-WENC Management Board with the necessary metadata and OGC® Services (such as WMS, WTLS, WFS, CWS) so that an up to date and comprehensive report of the status, coverage and quality of the IHO-approved WENC database can be maintained and made available. Reference: IHO CL51/2012.

Note: Para 2.7 needs to be refined and will be done so in conjunction with YG (original author) and IHB (customer for this requirement) before wide circulation.

- 4.8. REncs forming the IHO-WENC may develop their own individual policies and procedures in order to meet individual national member needs. However, these individual policies shall not undermine, nor conflict with, the IHO-WENC minimum REnc operating principles (which are set to ensure safe and consistent ENC data).
- 4.9. Participating REncs will retain the ability to distribute ENCs to their ENC distribution chain in accordance with their own policies thereby taking into account any applicable individual HO national caveats. Such REnc policies should be published and may be subject to independent review if requested by any member HO, to address any arising concerns such as data authentication, integrity, piracy or under-reporting of distribution. Reference: S-65 Stage 10.

5. IHO-WENC Management Board

- 5.1. The IHO-WENC Management Board and the REncs will operate under the formal IHO structure. This will give full visibility of operations and recognition of the REnc contribution to the ENC value chain.
- 5.2. The IHO-WENC Management Board will be composed of:
- President or Director of the IHB (Chair)
 - Representative from each HO hosting a REnc office
 - Chair of each REnc Governing Body
 - Vice Chair of each REnc Governing Body
 - Chair of WENDWG
- 5.3. The IHO-WENC Management Board shall oversee, support and guide REnc activities according to the terms of reference provided in Annex A. Specifically, its purpose is:
- 5.3.1. To harmonise REnc services by providing guidance and advice on best practice to the Governing Bodies of the REncs (as identified during audits of REnc offices).
- 5.3.2. To audit REnc offices against the published minimum IHO REnc operating procedures (as described in section 4) according to the provisions described in Annex B.

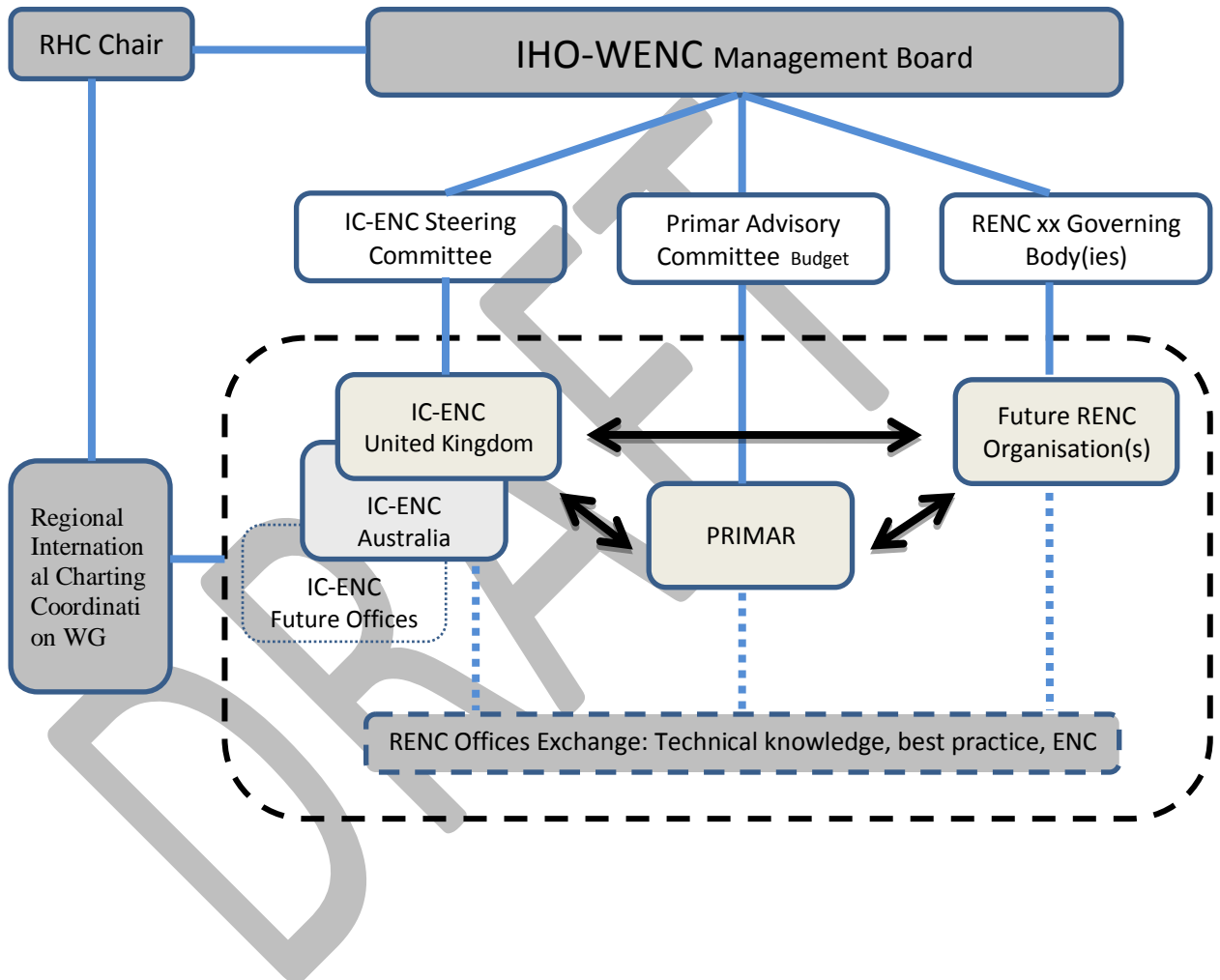
- 5.3.3. To liaise with and offer guidance to RHC Chairs as required, and to encourage action by HOs on ENC quality issues identified by the RENC Quality Assurance process.
 - 5.3.4. To facilitate the further development of RENC operations in order to fully implement the WEND (as per the RHSB work plan endorsed at IRCC5, June 2013).
 - 5.3.5. The Chair, having oversight of all aspects of RENC operations, will provide impartial advice on RENC services to HOs considering cooperating with a RENC.
- 5.4. Introducing the IHO-WENC Management Board, and operating principles for RENCs, will provide the following benefits to users of the ENCs, HOs and RENC offices:
- 5.4.1. Ensure a minimum level of quality and consistency in ENCs.
RENCs will operate to the standard set of published minimum requirements. This will ensure that all ENCs that are subject to the RENC quality assurance process reach, at the very least, the minimum required quality level in terms of data structure, coverage, consistency and maintenance.
 - 5.4.2. Improve levels of quality of ENCs.
RENCs will provide guidance and support to HOs (to those that seek it) on actions that they may wish to take to make their ENC quality level as high as possible (in terms of data structure, coverage, consistency and maintenance).
The IHO-WENC Management Board will drive improvements in ENC quality by recognising and promoting best practice to the RENC governing bodies.
 - 5.4.3. Improve the resolution of ENC quality and coverage issues
HOs remain responsible for, and retain full ownership of, their ENCs. However, the IHO-WENC Management Board, in conjunction with the RHC Chairs, will be able to provide independent guidance and advice to HOs to help resolve ENC quality and coverage issues, in the event that resolution at the technical level is not achieved.
 - 5.4.4. Harmonising RENC ENC quality assurance processes
All RENC offices in the IHO structure will be harmonised and operating openly and transparently. The audit function will independently ensure RENC offices conform to these requirements. RENC procedures can be assessed and compared against each other, ensuring that the performance of both existing and future RENCs is harmonised.
 - 5.4.5. Increasing the number and coverage of ENCs that are Quality Assured by a RENC
Placing the WEND and RENCs within the IHO structure is expected to increase the levels of RENC membership by IHO Member States.

This will then increase the number and coverage of ENC's subject to the IHO RENC Quality Assurance processes and the availability of ENC's via the WEND distribution channels.

5.4.6. Achieving the vision of the WEND Principles

RENCs will support HO's, RHCs and WENDWG in achieving the WEND Principles of complete and seamless ENC coverage available through end user service providers.

5.5. The concept can be described diagrammatically:



Annex A Terms of Reference of the IHO-WENC Management Board

1. Activities

The IHO-WENC Management Board will:

- 1.1. Meet once a year, preferably aligned with meetings of the WENDWG, at no additional cost to the IHO. Recommendations will be reported to the WENDWG.
- 1.2. Establish, publish and promote minimum RENC operating procedures. An audit function will be established to encourage action.
- 1.3. Conduct regular audits of each RENC office, against the minimum RENC operating procedures and include spot checks of ENC data available through the RENC. The audit schedule will be determined by the IHO-WENC Management Board
- 1.4. Provide guidance when requested by HOs or RENCs or when deemed appropriate.
- 1.5. Provide advice on best practices as defined from audits and based on agreed standards of data quality and distribution (aiming for user friendly, 'one-stop-shop' wide data availability ENC services).

2. Procedures

- 2.1. Management Board decisions will be made by consensus.
- 2.2. Funded in accordance with RENC policies on Chair/Vice chair positions.

Annex B – Audits of RENCs

1. Small Audit Teams will be chaired by the IHB, assisted by selected representatives of at least one participating Member State with IHB support staff as required. The cost of audits will be met by the RENC being audited (travel, time, accommodation, etc.)
2. On completion of an audit, an Audit report will be submitted to the Chair of the IHO-WENC Management Board. The Chair of the IHO-WENC Management Board will determine appropriate courses of action with the Chair of the relevant RENC Governing Body.

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