

Paper for Consideration by WEND
A REVIEW OF THE WEND PRINCIPLES

Submitted by:	WEND Task Group
Executive Summary:	The WEND TG was provided with information on significant issues related to the provision of integrated services. A task group meeting was held to review this information from which it was concluded that a thorough review of the WEND Principles was required to provide clarification and guidance to Member States in order to assist in resolution of the issues. This paper presents the Task Group's conclusions along with a set of draft revised principles (attached as Annex A) resulting from the review conducted.
Related Documents:	IHO M3: TR K2.19 (WEND Principles), A3.11, and A3.12, IHO Convention, SOLAS Chapter V
Related Projects:	Not applicable

Introduction / Background

A meeting of the core WEND Task Group (TG) was convened in response to rising concerns about difficulties in providing integrated ENC services. The TG considered the matters raised (including quality and consistency issues) and agreed that they were substantial and needed to be resolved as a matter of urgency. The TG reviewed the WEND Principles to see if their clarification or modification could address the concerns and came to the conclusion that a fundamental review rather than an editorial update of the Principles was needed.

The TG has produced a revised version of the Principles with the intention of giving them a more logical structure, removing ambiguities, simplifying content and providing clarification wherever possible. The TG also concluded that the WEND Principles were in effect a statement of the IHO's long term aim for ENC provision and agreed that much work remains if the community is to achieve the ultimate aims of the Principles. It was therefore decided that the Principles should contain commentary that clearly separates the substance of the principles from explanatory notes that link the current situation with the principal aims.

Analysis/Discussion

IHO is encouraging the transition from paper charts to electronic navigation through its support of a carriage requirement for ECDIS. It follows that the IHO is under an obligation, if not legal then at least moral, to ensure that mariners are as well served by ENC services as they are in the existing paper chart regime.

There are an increasing number of vessels using ECDIS/ENC for primary navigation and in recent weeks a mandatory carriage regulation for ECDIS has been submitted by the IMO NAV Sub-Committee to MSC for adoption. Fundamental to the IMO NAV Sub-Committee recommendation is that ENC coverage and services should at least match the paper chart based services already available for vessels engaged on international voyages. These developments now place a significant responsibility on IHO to ensure that all ENCs being distributed for use in ECDIS fully meet SOLAS requirements; in particular that they are adequate and up to date in accordance with SOLAS Chapter V Regulation 27, and that they also follow the IHO mission by providing for "the greatest possible uniformity in nautical charts and documents" (Art. II, IHO Convention).

The information provided to the TG showed that there are undesirable issues of varying significance related to consistency, quality and updating of ENC's for many parts of the world and that this needs urgent attention. The TG concluded that the WEND Principles and their common interpretation were not assisting in the resolution of these issues. The situation is not helped by some nation's ENC's being restricted to local or regional distribution and also that the RENC's operate different distribution models. After consideration the TG determined that a fundamental review of the Principles was necessary.

Mariners judge the quality and availability of 'official' charts and in particular ENC's as part of a global service; they do not differentiate between national providers. Experience shows that if some ENC's are of poor quality or not updated, this reflects badly on the total service. Furthermore where coverage is missing or inconsistent mariners and IMO will perceive this as a failure of IHO. This directly undermines the status of the IHO and all its Member States and their role in promoting the WEND and worldwide availability of consistent, reliable and good quality ENC's. For these reasons, the TG believes that the currently unsatisfactory situation is of utmost importance to all Member States and must be addressed collectively.

The use of private (unauthorised) vector data in ECDIS equipment is commonplace and, while in contravention of SOLAS requirements, is nevertheless increasingly relied upon for primary navigation with official paper charts being carried purely to cover any port authority inspection rather than for actual use. Many mariners consider that this data and the coverage to be better than ENC's, generally at lower cost, and importantly, the content can be more consistent due to the provider's ability to harmonise all contributing datasets before they are offered in their consolidated services. ENC services must be improved to overcome these perceptions if ENC's are to be readily accepted by the majority of mariners.

Summary

Hydrographic Offices are obliged to provide what the shipping industry requires to meet SOLAS requirements (see SOLAS Chapter V Reg.9). If they cannot do so then others will come forward to meet that need. Presently the expectation from IMO is that the IHO community will ensure adequate ENC services that will at least replicate the quality and accuracy, as well as improve upon the functionality and convenience provided in the paper chart environment.

Mariners and IMO now expect at least the same availability and quality of content of ENC's that they already enjoy with paper charts, and also greater data consistency and easier updating. The successful delivery of this requirement can only be as strong as the weakest link. This is why it is an issue for ALL Member States regardless of how good their own ENC's/services may be.

It is particularly important to identify and be able to overcome any weaknesses in the WEND concept at WEND 11 prior to discussions on the adoption of a mandatory carriage requirement for ECDIS at IMO MSC in November. The revised WEND Principles proposed by the WEND TG are intended to provide much needed clarity and guidance to all Member States in this respect.

The revised WEND Principles

The concept that all official ENC data forms part of a single entity is not new; it was the basis of the discussion of WEND and is embodied in the term "WEND" itself; however, this meaning has not previously been formally articulated. The WEND TG therefore felt that there was a need for a clear definition of the term WEND as a basis from which conclusions as to cooperation and organisational solutions could then be drawn.

The revised principles have been restructured into four sections:

- Coastal State responsibilities
- Reference Standards and Implementation
- Capacity Building and Cooperation
- Integrated services

In summary, the more significant amendments proposed are:

1. Emphasis is placed on the need for Coastal States to ensure arrangements are in place for the provision of ENC coverage rather than inferring a requirement that each State produces its own ENCs. This is in recognition that many Coastal States do not have the appropriate infrastructure to take on such work at this time. Capacity building remains an important element of WEND but this is not a short term solution. Experience has shown that it is inadvisable for HOs to set out to produce ENCs independently without having well established cartographic expertise and a sound organisational infrastructure. In order to promote seamless and contiguous coverage a new principle has been added to specifically allow Member States, with appropriate agreement, to produce ENCs on an interim basis where Coastal State coverage is not yet available.
2. Recognition that there are an unacceptable number of areas where, for a variety of reasons overlapping ENCs have been produced creating a situation which potentially compromises local navigational safety. States producing overlapping ENCs should expect such ENCs to be removed from end user services.
3. Recognition that ENC quality is an issue that has to be addressed and that there is a consequent need for Member States to bring any deficiencies to the attention of the producer nation and the IHO so that appropriate action is taken to ensure that safety of navigation is not compromised. Where safety of navigation is at issue, it may be necessary for the production of substitute ENCs specifically to ensure the provision of seamless and reliable ENC coverage.
4. That RENCs are the preferred means to assure harmonisation of ENC coverage but with the recognition that a regional or bilateral approach which achieves the same result are choices that are valid. The main concern is to ensure that a high standard of ENC quality and consistency is achieved and maintained and that all ENCs are widely distributed.
5. Capacity building should be treated as high priority. However due note should be taken of the CBC phased approach to capacity building and the need for a Coastal State to have cartographic capability and infrastructure as a pre-requisite for ENC production.
6. Member States are encouraged to review their position with regard to SENC distribution in line with comments made at recent ECDIS Stakeholder Group meetings

Conclusions

There are significant issues with regard to ENC provision that need to be addressed by IHO. The WEND principles as currently stated and interpreted do not assist in the resolution of these issues. IHO must act to ensure that the Principles allow sufficient flexibility to ensure that the mariner is able to receive services at least equivalent to the paper chart. Failure to recognise this and address the issues will erode the status of the 'official' offering with the potential for longer term consequences. IHO Member States need to recognise that the WEND Principles are a long term ambition and that in the short to medium term practical solutions will need to be found and implemented to allow Member States freedom to act in the interests of the mariner and the IHO.

Recommendations

- To consider and adopt the draft revised WEND Principles at Annex A.
- To agree that the underlying WEND Principles are a sound long term aim but that in the short term some additional flexibility is necessary
- To work cooperatively to ensure that safety of navigation is not compromised in the transition from paper to electronic navigation.
- That all Member States that are not yet a member of a RENC to reconsider their position with regard to joining.
- That existing RENCs investigate the possibility of merging their operations with a view to forming a single worldwide RENC ("WENC")

- For the WEND Committee to reconsider how the full implementation of WEND aims might be accomplished in the longer term, under the new IHO structure (IRCC, RHCs).

Justification and Impacts

Actioning the recommendations proposed above will support the provision of consistent and high quality official charting and the longer term implementation of WEND. There is little direct impact for the majority of Member States other than the recognition of WEND as a fundamental long term aim of IHO and the need for some flexibility of approach in the short term. For Member States who may be more directly involved in action to address the issues raised there will be a need to work in cooperation with other Member States for the benefit of the mariner and the long term success of WEND.

Action Required of WEND

The WEND Committee is invited to:

- a. Note the contents of this report
- b. Agree that action is needed to ensure that ENC services provided to the mariner are at least to the same high standards as that provided in the paper chart regime.
- c. Act on the recommendations made and endorse the revised WEND Principles as a means to improve the current situation.

Annex A to WEND 11/07A

Draft Revised WEND Principles

The WEND is the totality of ENC's under a common IHO framework. Its aim is to ensure a world-wide consistent level of high-quality, updated ENC's through integrated services that supports chart carriage requirements of SOLAS Chapter V, and the requirements of the IMO Performance Standards for ECDIS. The framework is defined by the WEND Principles.

The elements of WEND are:

- The responsibilities of Coastal States to meet the obligations of SOLAS V/9,
- The reference standards and their implementation,
- Capacity Building and cooperation,
- Integrated services

Only data produced under this framework may be referred to as "WEND compliant".

1. Responsibilities of Coastal States

1.1 SOLAS Chapter V, Regulation 9, requires Contracting Governments to coordinate their activities and to ensure that hydrographic data are available for waters under their national jurisdiction in a suitable manner in order to satisfy the needs of safe navigation.

Note:

1. *A mandatory carriage requirement for ECDIS means a consequential obligation on Coastal States to ensure the provision of ENC's.*

1.2 [By the dates established by IMO](#), Coastal States may satisfy the obligations in clause 1.1 by either:

- a. Producing the necessary ENC coverage, or
- b. Agreeing with other States to produce the necessary ENC coverage on their behalf.

Notes:

1. *If the Coastal State is the issuing authority (in terms of SOLAS V 2.2) then responsibility for the ENC's lies with them regardless of whether the production and maintenance is undertaken with the assistance of commercial contractors or other Member State HO.*

2. *Where agreement is given to another Member State to produce and issue ENC's on behalf of a Coastal State the producing / issuing Member State will carry the responsibility for the ENC.*

3. *States providing source data to another State for the compilation of ENC's are responsible for advising that producer State of update information in a timely manner.*

4. *Member States should take into consideration the complexity and resource requirements of the ENC production and maintenance task in relation to their own capabilities when deciding how to best meet the requirements of clause 1.1*

5. *Subject to appropriate agreement, it is acceptable for a Member State to produce ENC's as an interim measure to fill gaps in existing Coastal States coverage to promote contiguous*

coverage. Such ENC's should be withdrawn when adequate coverage is made available by the Coastal State.

1.3 Coastal States should work together under the umbrella of the IHO and in particular with RHCs to establish responsibilities for providing contiguous, non-overlapping ENC coverage in all areas including international waters.

Notes:

1. The INT chart system may be a useful basis for designing the ENC schema.

2. In international waters, the INT chart producer nation shall be assumed to be the producer of the corresponding ENC. Where the offshore limits of waters under national jurisdiction have not yet been established, clause 1.4 should apply.

3. In areas where the paper INT charts overlap, neighbouring producer nations should agree a common limit of ENC production in the overlapping areas. Cartographic boundaries should be as simple as possible; for example: a succession of straight segments and turning points corresponding to such things as meridians, parallels, or chart limits. Where different producer nations are responsible for INT coverage of the same area at different scales, those nations should agree on a suitable set of boundaries so as to provide the user with the most coherent service possible.

4. In areas of national jurisdiction for which there is no recognised ENC producer nation, the Regional Hydrographic Commission (or similar body) should determine the ENC producer nation. ENC's produced under such arrangements should be offered for transfer to the Coastal State in the event that the Coastal State subsequently develops the capacity to maintain the ENC's. Such transfer should respect the moral rights of the Coastal State and the commercial rights of the producer nation.

5. The S57 standard requires that there is no overlap of ENC data within usage bands. ECDIS systems will operate unpredictably in areas where overlapping ENC data is present; for this reason overlapping ENC data is not acceptable in end-user services. Where overlapping coverage exists the producing States should recognise their responsibility for any consequences resulting from this situation and may expect organisations providing end-user services to take action to remove areas of overlap.

6. Exceptionally a Member State may create additional ENC's to facilitate unified coverage where such production is undertaken specifically to address issues inhibiting provision of ENC coverage in accordance with the long term aims of the WEND Principles. A Member State undertaking such production should have valid reasons for their actions and should lodge these with IHB.

1.4 For cartographic convenience ENC production boundaries other than established national boundaries may be agreed within a technical arrangement. These limits shall not be construed as having any significance or status regarding political or other jurisdictional boundaries.

1.5 When the production limits are the official limits for national jurisdiction waters, commercial rights shall belong to the ENC producing country.

1.6 When the production limits are cartographic boundaries as opposed to national boundaries, the commercial rights shall normally belong to the ENC producing country but may possibly be encumbered by the payment of royalties to the relevant country through a technical arrangement (see clause 1.3).

1.7 Any State producing and authorising an ENC is responsible for its validation in terms of content, conformance to standards and consistency across cell boundaries.

Notes:

- 1. In order to ensure uniform quality and consistency of the WEND, Member States should cooperate in accordance with clause 2.2.*
- 2. Member States should recognize their potential exposure to legal liability for ENCs*

1.8 To ensure that the WEND database is maintained to the highest quality standard IHO Member States that identify an error or any other deficiency in an issued ENC, or that receive information indicating such a deficiency, must bring this to the attention of the ENC producer so that the problem can be resolved at the earliest opportunity. Member States should act to ensure that appropriate actions are taken so that the safety of navigation is not compromised.

1.9 In producing ENCs, States are to take due account of the rights of the owners of source data and if paper chart coverage has been published by another Member State, the rights of that State.

1.10 IHO Member States should cooperate to ensure that consistent, high quality and up-to-date ENCs are available to meet the needs of the mariner.

2. Reference Standards and Implementation

2.1 To meet SOLAS requirements ENCs must conform to all relevant IHO and IMO standards.

2.2 States should harmonise their ENCs through the use of RENCs¹, the work of Regional Hydrographic Commissions and also through multilateral and bilateral arrangements.

Notes:

- 1. Harmonization means the uniform implementation of S57 and other applicable standards, according to common IHO implementation rules as described in S-58, S-65 and the S-57 Encoding Bulletins.*
- 2. Member States are encouraged to distribute their ENCs through a RENC in order to share in common experience and reduce expenditure, and to ensure the greatest possible standardization, consistency, reliability and availability of ENCs.*
- 3. Member States not wishing to join a RENC should make appropriate arrangements to ensure that their ENCs meet WEND requirements for consistency and quality and are widely distributed.*

2.3 The updating of an ENC should at least match the updating service for the corresponding paper charts in order to meet SOLAS V/9 obligations. ENC updates should at a minimum be validated and made available through the same supply chain as ENCs.

2.4 To best satisfy the obligations under SOLAS V/9 all elements of the WEND should be underpinned by certified Quality Management Systems.

Notes:

- 1. Typically, the Quality Management Standard will be ISO9001:2000.*

¹ RENCs are organisational entities where IHO members have established co-operation amongst each other to guarantee a world-wide consistent level of high quality data, and for bringing about co-ordinated services with official ENCs and updates to them.

3. Capacity Building and Cooperation

3.1 Whenever possible, Member States should provide, upon request, training and advice to States that require it in order to develop their ability to comply with obligations stated in clause 1.1.

Notes:

1. Assistance may cover aspects such as development of an ENC production capability, ENC quality and the role of RENCs in ENC validation and distribution.

2. It is essential that Coastal States have established cartographic capability and infrastructure prior to undertaking ENC production and maintenance tasks themselves so as to ensure that the ENCs within the WEND database meet the high quality standards necessary to fulfil SOLAS requirements.

3.2 IHO Member States should consider ENC related projects as high priority capacity building initiatives.

4. Integrated services²

4.1 Coastal States should ensure that their ENCs form part of the WEND so that they are available to users through the widest range of integrated services.

Notes:

1. Producer States are responsible for the content and format of their ENCs up to the point that they are delivered to a RENC and/or data server; they are not responsible for the continued integrity of the ENCs through subsequent distribution channels. If required, it will be for the RENC and/or data server to be able to demonstrate that the ENCs have not been corrupted between receipt from the producing State and inclusion within, and delivery of, an integrated service.

2. RENCs should cooperate to ensure that ENCs are harmonised to the same quality standards thereby facilitating integrated services.

4.2 When an encryption mechanism is employed to protect the ENC product this should be achieved by using S63 (see IHO TR A3.12).

Notes:

1. S-63 is used for ENC distribution to end users, to ensure data integrity, to safeguard national copyright in ENC data, to protect the mariner from falsified products, and to ensure traceability.

2. Member States only need to consider the use of S-63 if they intend to deliver an end user service. Data Servers (ie. service providers) and equipment manufacturers are responsible for implementing S-63 and form part of the 'S-63 trusted circle' (ie. are entrusted to protect the ENCs and the encryption process).

4.3 A Member State undertaking the integration of national ENC datasets into a wider service is responsible for any changes resulting from that integration.

4.4 Member States are encouraged to consider the distribution of ENCs in SENC format in accordance with IHO TR A3.11.

² Integrated services are a variety of end-user services where each service is selling all its ENC data, regardless of source, to the end user within a single service proposition embracing format, data protection scheme and updating mechanism packaged in a single exchange set.