

**REPORT OF THE WORLDWIDE ELECTRONIC NAVIGATIONAL CHART
DATA BASE (WEND) COMMITTEE
by the Chairman, Captain Abri KAMPFER, South Africa**

1. Chairman: Captain A. KAMPFER (South Africa) (since June 06)
Captain R.L. PARSONS (USA) (July 04 - May 06)
Rear Admiral K.R. SRINIVASAN (India) (Jan. 03 - June 04)
Dr. P. EHLERS (Germany) (until Dec. 02)

Vice-Chairman: Captain S. BARNUM (USA) (since June 06)
Captain A. KAMPFER (South Africa) (Jan. 03 - May 06)
Rear Admiral K.R. SRINIVASAN (India) (until Dec. 02)

Secretary: Ing. en chef M. HUET (IHB) (since Sept. 02)
Rear Admiral N. GUY (IHB) (until Aug. 02)

2. Membership: **IHO Member States**
Algeria, Argentina, Australia, Brazil, Canada, Chile, China, Cuba,
Denmark, Ecuador, Estonia, Finland, France, Germany, Greece,
India, Indonesia, Italy, Japan, Korea (Rep. of), Malaysia, Mexico,
Netherlands, New Zealand, Norway, Oman, Peru, Portugal, Russian
Federation, Singapore, South Africa, Spain, Sweden, Thailand,
Turkey, Ukraine, UK, USA, Venezuela.

Observers: Comité International Radio Maritime (CIRM)
International Centre for ENC's (IC-ENC)
Cruise Lines International Association (CLIA)
Intergovernmental Oceanographic Commission (IOC)
Open ECDIS Forum (OEF)
PRIMAR
Radio Technical Commission for Aeronautics (RTCA)

3. Meetings

The Committee has met twice over the past two years, under the Chairmanship of Captain Abri KAMPFER (South Africa):

3.1 Extraordinary WEND Meeting, IHB, Monaco, 30 October 2007

This meeting was convened to examine the status of production of ENC's and the possible problems that are connected with this and to discuss and decide the actions that are required for the IHO to fulfill its commitments to achieve adequate coverage, availability, consistency and quality of ENC's by 2010, in accordance with the relevant Resolutions approved at the 17th International Hydrographic Conference.

Various presentations were made, including estimates on the current global coverage of ENC and the reported ENC coverage forecasts for 2010. Areas where there is limited or no current ENC production plans were identified. Information related to ENC consistency and ENC pricing was provided.

The Committee was briefed on the discussions held at the 2007 NAV meeting regarding carriage requirements for ECDIS and on the significant importance to the IHO of ensuring that it presents a comprehensive and persuasive report of the status of global ENC coverage and availability at NAV meetings. This should include a priority to ensure adequate ENC coverage for the world's major trading routes and ports, improving the consistency of ENC's, and acknowledging that the price of ENC's is a factor in the uptake of ECDIS.

The Committee strongly encouraged HOs to follow the IHO guidelines on consistency of ENC data, especially the use of SCAMIN and noted that RENCs and RHCs have a vital role to play in ensuring consistency of ENCs. It agreed that ENC producer nations should take account of the comments made during the meeting regarding mariners' feedback on ENC pricing when they next consider their ENC pricing and distribution policies.

The Committee also provided outline guidance to the IHB on how the IHO's position should be presented at the 2008 meeting of NAV.

3.2 11th WEND Meeting, Tokyo, Japan, 2-5 September 2008

The principal topic for discussion was a review of the WEND Principles – and in particular the need for guidance notes concerning the harmonization and quality of data in ENCs. As a result, the Committee prepared and agreed a WEND Committee paper - *Guidelines for the Implementation of the WEND Principles*. It is attached at Annex A to this report.

The WEND Committee considered a *Data Chain Certification Concept* presented by RTCA and invited the RTCA delegate to convene an informal correspondence group to further study its potential application to the chart and nautical publications data distribution chain, and present a progress report at IRCC-1 (see Annex B). The Committee considered mechanisms to better coordinate the scheming and production of small and medium scale ENCs on a regional basis.

The meeting concluded with discussion on the transition arrangements for WEND activities to be taken over by the Inter-Regional coordination Committee (IRCC) from January 1 2009. The Committee recommended that the IRCC consider establishing a Group similar to the WEND TG to undertake specific tasks related to the ongoing development and implementation of the WEND concept.

An ECDIS Stakeholders' Forum was held midway through the meeting.

4. WEND Task Group

The WEND TG, chaired by Mr. Horst HECHT (Germany), met three times over the past two years:

4.1 5th TG Meeting, Paris, France, 30-31 August 2007

The meeting took note of the directions provided by the WEND Committee at its meeting in September 2006. It also took into consideration the outcomes of NAV53, held in July 2007, concerning mandatory carriage requirements for ECDIS. This indicated a requirement for IHO to provide a clear and comprehensive presentation of the status of adequate global ENC coverage to the 2008 meeting of NAV (NAV54).

The meeting considered appropriate methods to assess and report on the level of adequate global ENC coverage and developed a work plan to achieve this. A brief progress report would be presented to the WEND at its Extraordinary Meeting in Monaco, in October 2007. A final report would be circulated by the TG in mid February 2008 for consideration by the WEND Committee at its ordinary meeting in Tokyo, Japan and also for incorporation, as appropriate, in an IHO submission to NAV54.

4.2 6th TG Meeting, IHB, Monaco, 28-29 January 2008

The meeting reviewed progress on the Task Group's analysis of global ENC coverage and discussed how this and related information on ENCs should best be incorporated in the IHO's submission to NAV54, when it considers mandatory carriage requirements for ECDIS. The group also discussed the main elements of the IHO ENC Catalogue and its relation to other catalogues, as well as the responsibilities of IHO and IMO for updating the joint Primar/IC-ENC information paper "Facts about electronic charts and carriage requirements".

4.3 7th TG Meeting, Lisbon, Portugal, 23-24 June 2008

In the context of worldwide availability of ENCs, the TG reviewed the effectiveness of the WEND concept and in particular whether the WEND Principles provided clear guidance on the roles, responsibilities, obligations and options for States in the production, maintenance and distribution of ENCs.

The meeting developed various proposed improvements and clarifications to the WEND Principles, for submission to the 2008 WEND meeting in Tokyo for consideration.

5. Interaction with other Organizations and Groups

The main IHO Committee with which the WEND Committee interacted is CHRIS (now, HSSC). It was important that the technical issues addressed by both committees were harmonised and this occurred particularly on the following issues:

- Guidance for the submission of reports and proposals for consideration by WEND.
- Recommended changes to ECDIS type-approval testing.
- Improved ENC consistency.
- Principles and procedures for making changes to IHO standards.
- IHO information paper on S-100.
- Impact of S-101 (future ENC Product Specification) on all ECDIS stakeholders.
- Use of the IHO Data Protection Scheme S-63.
- Use of the Open ECDIS Forum (OEF).
- Communication with IMO regarding the need to develop a mechanism to deal with software changes to ECDIS.

WEND received reports from RHCs on ENC scheming, production and availability, for consideration at meetings. Contribution of RHCs is essential to achieve global ENC coverage. WEND cooperated with the existing two RENCs: IC-ENC and Primar. They had observer status at WEND meetings and their collaboration was found most useful in seeking efficient ENC distribution services and building ENC catalogues.

6. Outstanding Issues

The major WEND outstanding issue remains the achievement of full ENC coverage through implementation of the WEND Principles.

The table at Annex C provides the status of actions from WEND-11. As can be seen, most of the actions have been completed.

9. Proposals for adoption by the IRCC

The IRCC is invited to:

Note this Report.

Consider establishing a dedicated group to monitor and address the ongoing coordination and implementation of the WEND Principles and global ENC coverage. Proposed Terms of Reference and Rules of Procedure developed by WEND-11 are shown at Annex D.

GUIDELINES FOR THE IMPLEMENTATION OF THE WEND PRINCIPLES

The International Hydrographic Organization (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 should ensure that mariners are well served by adequate ENC services.

Noting that there are significant improvements required related to coverage, consistency, quality, updating and distribution of ENCs for many parts of the world and that this needs urgent attention, the WEND committee invites IHO Member States to apply the following guidelines for the implementation of the WEND principles (Technical Resolution K2.19).

1. Responsibilities of Coastal States

1.1. A mandatory carriage requirement for ECDIS means a consequential obligation on Coastal States to ensure the provision of ENCs.

1.2. If the coastal State is the issuing authority (in terms of SOLAS V 2.2) then responsibility for the ENCs should lie with it regardless of whether the production and maintenance is undertaken with the assistance of commercial contractors or another Member State.

1.3. Where agreement is given to another Member State to produce and issue ENCs on behalf of a Coastal State the producing / issuing Member State should carry the responsibility for the ENC.

1.4. States providing source data to another State for the compilation of ENCs should advise that producer State of update information in a timely manner.

1.5. Member States should take into consideration the complexity and resource requirements of the ENC production and maintenance task in relation to their own capabilities and options when deciding how to best ensure the provision of ENCs for their waters.

1.6. Subject to appropriate agreement, it is acceptable for a Member State or a group of Member States to produce ENCs as an interim measure to fill gaps in existing coastal States' coverage to promote contiguous coverage. Such ENCs should be withdrawn when adequate coverage is made available by the coastal State.

1.7. The S-57 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 recognize their responsibility and take the necessary steps to resolve the situation. In situations where overlapping data cannot be resolved through negotiation, the ENC producer(s) can anticipate that an end user service provider may need to take action itself to eliminate the overlap or discontinue services until the issue is satisfactorily addressed. Any such action to eliminate overlap should be communicated in advance to the affected ENC producer(s) and be based on guidelines that emphasize navigation safety, such as the following:

1. Scale of the data compiled in the ENC,
2. Currency of data in the ENC - i.e. most recent surveys, shoalest soundings, wrecks, rocks, and obstructions,
3. Avoidance of dividing navigationally significant features between producers. For example, Traffic Separation Schemes should be handled by one producer or the other.

1.8. 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 for the safety of navigation in accordance with the long term aims of the WEND Principles. A Member State undertaking such production should have very valid reasons for its actions and, beforehand, should have made reasonable efforts to negotiate with and come to some agreement with the State that has jurisdiction over the area in question. RHCs should place a high priority on filling ENC gaps.

1.9. In order to ensure uniform quality and consistency of the WEND, Member States should cooperate in accordance with clause 1.3 of the WEND Principles.

1.10. To ensure that the WEND database is maintained to the highest quality standard 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.

2. Reference Standards and Implementation

2.1. Harmonization means the uniform implementation of S-57 and other applicable standards, according to common IHO implementation rules as described in S-58, S-65 and the S-57 Encoding Bulletins.

2.2. Member States not wishing to join a RENC should make appropriate arrangements to ensure that their ENC's meet WEND requirements for consistency and quality and are widely distributed.

3. Capacity Building and Cooperation

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

3.2. 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 ENC's within the WEND database meet the high quality standards necessary to fulfil SOLAS requirements.

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

4. Integrated services

4.1. Member States and RENCs should cooperate to ensure that ENC's are harmonised to the same quality standards thereby facilitating integrated services.

4.2. Member States only need to consider the use of S-63 if they intend to deliver a service to end users. Data Servers (i.e. service providers) and equipment manufacturers are responsible for implementing S-63 and form part of the 'S-63 trusted circle' (i.e. are entrusted to protect the ENC's and the encryption process).

Annex B to WEND Report to IRCC-1

INFORMATION PAPER

STATUS REPORT ON Correspondence Group for Data Supply Chain Certification (DSCC)

Submitted by:	Chair DSCC Correspondence Group
Chairman:	Mr Michael Bergmann (RTCA)
Members:	Belgium, Brazil, Canada, Chile, Denmark, Ecuador, Finland, France, Germany, Korea – Rep., Netherlands, Norway, Poland, United Kingdom, United States of America, Chair DPSWG, Chair DQWG, Chair TSMAD, University of New Hampshire, IC-ENC, Primar, ECC, Jeppesen

Introduction

During WEND 11 the RTCA Observer at IHO presented the idea of a “Data Supply Chain Certification” as a means of ensuring quality in a data supply chain, which becomes more complex with the advent of new and emerging technologies and in light of e-nav.

The discussion during WEND 11 resulted in the following action items (from the minutes of WEND 11):

- The **RTCA** delegate to convene a Correspondence Group on *Data Chain Certification Concept*. (**Action 11/6 – RTCA**)
- The **RTCA** delegate to present the *Data Chain Certification Concept* to CHRIS-20. (**Action 11/7 – RTCA**)
- **IHB** to recommend that CHRIS members be invited to participate in the correspondence group on *Data Chain Certification Concept*. (**Action 11/8 – IHB**)
- The **RTCA** delegate to present a progress report from the Correspondence Group on *Data Chain Certification Concept* to IRCC-1. (**Action 11/9 – RTCA**)

The discussion on the same topic at CHRIS 20 (see action item above) were summarized in the following action items from that conference (from minutes of CHRIS 20):

- **Action 20/7 – IHB** to encourage MS to participate in the RTCA Correspondence Group on Data Chain Certification Concept.
- **Action 20/8 - RTCA Correspondence Group** to liaise with DQWG and DPSWG.
- **Action 20/9 - RTCA Correspondence Group Leader** to report on progress to HSSC-1.

In its “Terms of Reference” the Correspondence Group defined the following objectives:

- a. Review the current Maritime Data Supply Chain for electronic navigational charts (ENCs) and associated digital nautical publications (DNPs), identifying and documenting the different steps within this chain.
- b. Review the Data Supply Chain Certification concepts of related markets, mainly the DO-200A standard of aviation.

- c. Develop a proposal for IHO consideration on a standard for Data Supply Chain Certification relating to ENC's and DNPs.

Current status of the discussion

Based on the action item defined during WEND 11 (Action 11/6 – RTCA) the RTCA delegate has established the Correspondence Group in December 2008. A secure Google Groups Forum has been created and has 24 active members.

One of the standards developed by RTCA is called DO-200A and is used in aviation circles for Data Supply Chain Certification (DSCC) for advanced, high precision navigational data streams. As the S-100 series of standards evolve, the applicability of S-63 encryption comes under scrutiny. Given that, the discussion within the DSCC-CG is looking into the aspects of S-63, its applicability and limitations, especially in the S-100/S-101 context, keeping in mind the objectives of the DSCC-CG. While the participants agreed that data encryption supports the data quality concept, they highlighted the limitations when looking at the complete supply chain. The discussion on this specific aspect of data encryption is still ongoing and results will be included in the recommendation to IHO.

A second discussion thread is reviewing the affects of discussion in SNPWG, migrating towards S-100 series of standard. The figure 1, taken from a SNPWG document, illustrates well the intended future integration of nautical publications and ENCs. It is expected that further data integration will be developed, like MIO, IENC or PortENC.

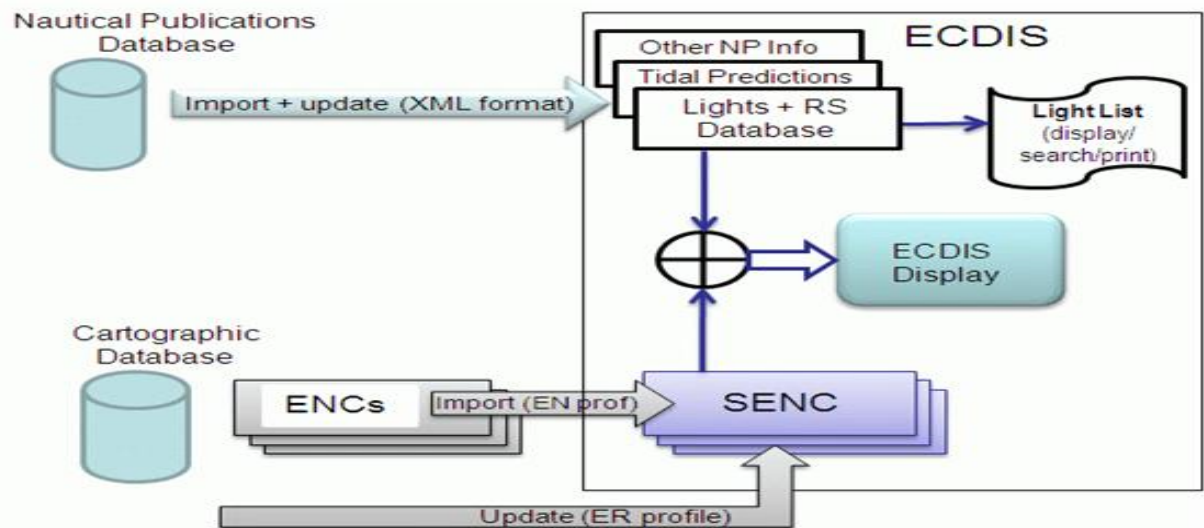


Figure 1 – Combining Nautical Publications and ENC data in an ECDIS

Source: Inclusion of Nautical Publications Information in the next ENC Product Specification (S-101) by *Tony Pharaoh - IHB*

As different data streams are combined in support of safe and efficient navigation, the data supply chain needs to ensure synchronization and consistent timely updates across all of the supporting data streams. This specific emerging need is being discussed as the potential need for a DSCC to support this requirement is being analyzed. The CG will further review this aspect of the supply chain and will include the results of the discussion in its recommendation as well.

Timetable

The DSCC-CG will consolidate the findings in a recommendation report to the inaugural meeting of the HSSC for consideration of any subsequent action.

Annex C to WEND Report to IRCC-1

STATUS OF ACTIONS FROM THE 11TH WEND MEETING

Action Number	Agenda Item	Subject	Action(s)	Status (May 09)
11/1	3	Customizing S-63	Chair ESF-4 to raise matter of customizing S-63 at ESF-4 to seek stakeholder confirmation that no further action is required.	Action complete.
11/2	3	ENC Coverage	IHB to monitor and report regularly on status of global ENC production and availability obtaining input from RENCs, RHCs and other relevant sources.	Done. See 4EIHC Doc. CONF.EX4/REP.05
11/3	3	Raising awareness at Government level	IHB to inform Member States by CL that the assistance of the DC is always available to approach the relevant authorities (including at senior governmental levels) using appropriate diplomatic, inter-governmental or other points of contact to raise the levels of awareness and commitment to provide appropriate hydrographic services, especially ENC coverage. IHB to then take appropriate action based on individual responses, taking note of the drafting notes prepared by WEND-11 Drafting Group in response to X-WEND-1 Action 5 (see Annex F to WEND11 Minutes).	1 st part done. See CL 72/2008 – <i>Raising government awareness of hydrography</i> No responses received to CL 72/2008; therefore, no action taken.
11/4	3	IMO MS obligations under SOLAS V/9	IHB to prepare a submission to IMO MSC inviting IMO to remind its MS of their obligations under SOLAS V/9.	MSC Circ.1118 appears to cover the subject already and remains in force. IMO procedures do not appear to allow reminders of the type proposed by WEND to be issued. A revised MSC Circ. could be proposed if there was a need to make significant changes to the original MSC Circ. Propose no further action.
11/5	5	Preparations for MSC85 and MSC86	IHB to prepare for MSC85 and MSC86 in relation to carriage requirements for ECDIS.	Done
11/6	6	Data Chain Certification Concept	The RTCA delegate to convene a Correspondence Group on <i>Data Chain Certification Concept</i> .	Done. See Annex B to WEND Report to IRCC-1.
11/7	6	Data Chain Certification Concept	The RTCA delegate to present the <i>Data Chain Certification Concept</i> to CHRIS-20.	Done. See Doc. CHRIS20-INF5.

11/8	6	Data Chain Certification Concept	IHB to recommend that CHRIS members be invited to participate in the correspondence group on <i>Data Chain Certification Concept</i> .	Done. See Action CHRIS 20/7 and CL 91/2008.
11/9	6	Data Chain Certification Concept	The RTCA delegate to present a progress report from the Correspondence Group on <i>Data Chain Certification Concept</i> to IRCC-1.	Done. See Annex B to WEND Report to IRCC-1.
11/10	6	South China Sea ENC's	IHB to issue CL informing MS of new edition of the South China Sea ENC's.	Done. See CL 74/2008 - New Editions of South China Sea ENC's
11/11	7	Small/medium scale ENC schemes	IHB to invite CHRIS/HSSC to consider developing guidelines for the preparation and maintenance of small/medium scale ENC schemes and determine whether they should be included in S-65 or a new document similar to M-11.	Done. See Action CHRIS 20/24. <i>Task given to CSPCWG.</i>
11/12	7	Small/medium scale ENC schemes	IHB to invite relevant RHCs and INT chart coordinators to coordinate the development of small/medium scale ENC schemes.	Will be completed as a result of Action by CSPCWG under CHRIS Action 20/23.
11/13	7	Small/medium scale ENC schemes	IHB to consider the potential use of the IHO Chart Catalogue on the web in support of the development of small/medium scale ENC schemes.	Will be completed by CSPCWG as a result of CHRIS Action 20/23.
11/14	8	ENC licensing, pricing and distribution	Chair ESF & IHB to prepare a CL highlighting ESF-4 feedback relating to licensing, pricing and distribution of ENC's.	Done. Included in CL 82/2008 - <i>11th Meeting of the WEND Committee, 4th ECDIS Stakeholders Forum 2-5 September 2008, Tokyo, Japan</i>
11/15	8	ENC licensing, pricing and distribution	IHB to propose the inclusion of a discussion on ENC licensing, pricing and distribution under the umbrella of the 4 th EIHC.	Done. ENC distribution and associated issues have been included in the topics for discussion at 4EIHC
11/16	9	Transition to IRCC	Chair WEND & IHB to prepare a transition report, circulate the draft to WEND-11 participants and then submit final report to IRCC.	Done. See WEND Report to IRCC-1.
11/17	9	Transition to IRCC	Chair WEND to recommend to IRCC to consider establishing a WEND TG with the TORs and ROPs agreed by the WEND-11.	Done. See WEND Report to IRCC-1.

Annex D to WEND Report to IRCC-1

Proposed RoP and ToR for an IRCC WEND (Task) Group

(As agreed by WEND-11, Tokyo, Japan, September 2008)

Terms of Reference

1. Monitor the development of adequate ENC coverage to meet any carriage requirements for ECDIS,
2. Develop proposals for speeding up ENC production and ensuring uniform ENC quality and consistency, and for making data available worldwide, including SENC distribution, taking advantage of any offers for production assistance, or other ways of mutual assistance and co-operation.
3. Advise MS, where appropriate, on the need, as well as on methods and tools for validating the data, and on any assistance which could be offered by the RENCs.
4. Monitor the implementation of the WEND, in response to Decision 21 of the XVIIth IHC, and advise IRCC of appropriate measures for speeding-up the implementation process.
5. Assist in harmonizing the policies of regional ENC Coordinating Centres (RENC) with respect to matters related to administration, legality, finances, technical processes, et cetera.

Rules of Procedure

1. The Task Group shall be composed of a representative from each RENC, representatives as selected by the IRCC, and a representative from the IHB.
2. Expert Contributors may be invited to join the TG as required, according to the task at hand. Expert Contributors shall be invited by the Chair.
3. The Chair and Vice-Chair shall be representatives from the IRCC and shall be decided by vote of the Committee members present and voting at a meeting. If the Chair is unable to carry out the duties of the office, the Vice-Chair shall act as the Chair with the same powers and duties.
4. The requirement for the continued existence of the TG shall be reviewed at each meeting of the IRCC and IRCC representatives reconfirmed or selected as appropriate.
5. The TG shall conduct its business by correspondence to the maximum extent possible.
6. Decisions of the TG shall be made by consensus.