

17th CHRIS MEETING
Rostock, Germany, 5-9 September 2005

FINAL MINUTES

- Notes: 1) *The paragraph numbering is the same as in the agenda (Annex D).*
2) *A list of acronyms used in these Minutes is at Annex A.*
3) *A list of all actions agreed at CHRIS/16 is at Annex E*
4) *Names of persons are written in full the first time they appear in the Minutes. Afterwards, only the surname is shown.*

1. OPENING AND ADMINISTRATIVE ARRANGEMENTS

Docs: CHRIS17-1A rev.16 *List of Documents (also Annex B)*
CHRIS17-1B rev.10 *List of Participants (also Annex C)*
CHRISWG-MEM *Membership of CHRIS related WGs*
CHRIS-MEM *CHRIS Membership*

The 17th CHRIS Meeting was hosted by the German Hydrographic Office (BSH) and took place at the Courtyard Marriott Hotel, Rostock, Germany. The Chair (Capt. Robert WARD, Australia) opened the meeting. Prof. Dr. Peter EHLERS (President, BSH) welcomed all participants (Annex C) to Rostock and at the BSH. He noted the significance of having a CHRIS meeting for the first time in Rostock. He also stressed the importance of CHRIS as being the main IHO technical committee and the driving force for standardization in the Organization. In particular, S-57 has become widely recognized and used for geospatial hydrographic / marine information. S-57 Edition 4 should further contribute to this effort.

The Chair emphasized that the role of CHRIS is to:

- be the technical conscience of IHO;
- provide technical advice to Member States (MS);
- monitor the requirements and assess the needs of MS;
- consider proposals from MS and Non -Governmental International Organizations (NGIOs)
- recommend technical solutions;
- seek approval with MS, as appropriate, since it is they who ultimately will decide.

The Chair further explained that this meeting would include an ECDIS Stakeholders Forum on 6-7 September where important issues, such as the future edition of S-57, ENC consistency and ECDIS symbology, would be discussed and hopefully progressed.

The Secretary (Mr. Michel HUET, IHB) briefly reviewed the List of Documents (Annex B), noting that several new documents had been received very recently. The Chair stressed the importance of timely submission of papers.

Dr. Lee ALEXANDER (Univ. of NH, USA), HGMIO Chair and OEF Representative, kindly offered to serve as Rapporteur for the meeting, which was gratefully accepted.

2. APPROVAL OF AGENDA

Docs: CHRIS17-2A rev.14 *Agenda (also Annex D)*

The Chair suggested that the order of discussion for some items be adjusted. For instance, future S-57 Ed. 4, CHRIS Work Plan, and Changes to the ECDIS Performance Standards would best be discussed near the end of the meeting, i.e. after the ECDIS Stakeholders Forum. These minor amendments and the agenda (Annex D) were agreed.

Outcome

- Agenda approved, as amended.

3. MATTERS ARISING FROM MINUTES OF 16TH CHRIS MEETING

Docs: CHRIS17-3A Minutes of CHRIS16
CHRIS17-3B rev.1 List of Actions from CHRIS16 and Status
CHRIS17-3C rev.2 Terms of Reference for CHRIS Committee and related Working Groups

The Secretary briefly reviewed the Status of Actions arising from CHRIS16. The Chair summarized as follows [figures (#) refer to the Action Numbers in the left-hand column of CHRIS17-3B]:

#3 (CHRIS Work Plan) – Action closed. The formats / templates for submission of proposals to CHRIS, and for WG reports to CHRIS, as available on the IHO website, were considered sufficient and appropriate. There was no need for further templates. See also section 6.

#5.3 (Revision of S-52) – Action deferred till the IMO correspondence group on evaluation of the use of ECDIS and ENC Development, set up by IMO NAV51 (June 2005), has completed its work and that IMO has adopted revised Performance Standards for ECDIS. See also section 6.1.

#5.4 (Glossary of ECDIS-related Terms) – A small group was set up to review, during the meeting, the remaining 11 items not completed at CHRIS16. The results are summarized at Annex F. The Secretary was asked to forward all ECDIS-related terms and definitions, as contained in Annex I to minutes of CHRIS16 and in Annex F to these minutes, to the Chair / Secretary of the IHO Committee on the Hydrographic Dictionary (S-32).

#6 (Printed ENCs) – Action closed. This item was withdrawn by USA-NOAA.

#7.4 (S-57 e3.1 ENC PS to S-57 e4.0 ENC PS roadmap) – This issue would be addressed under agenda items 5.1 (TSMAD) and 9 (Liaison with Industry).

#8.2 (Alignment of S-52 with ISO 19117) – Action deferred and carried forward to CHRIS18. The Chairman of C&SMWG (Dr. Mathias JONAS, Germany) explained that C&SMWG was considering contracting a consultant to determine which parts of the PL are potentially affected by reorganisation according to ISO 19117 and to give advice about usefulness of transporting the exiting PL to this standard. See also section 5.2.

#8.3 (C&SMWG business case) – Action completed: see section D of CHRIS17-5.2A. This issue would further be discussed under agenda item 5.2 (C&SMWG).

#9 (revised ToRs for DPSWG) – Action deferred and carried forward to CHRIS18, due to the absence of the DPSWG Chairman (Mr. Robert SANDVIK, Norway).

#12 (ENC Catalogue on the IHO website) – Action closed. Reports on progress will be provided by the IHB as needed.

Outcome

- Minutes of CHRIS16 approved.

- Secretary to forward all ECDIS-related terms and definitions, as contained in Annex I to minutes of CHRIS16 and in Annex F to these minutes, to the Chair of the IHO Committee on the Hydrographic Dictionary (S-32), in view of their inclusion in S-32. **(Action)**

4. DECISIONS OF OTHER IHO BODIES AFFECTING CHRIS

4.1 WEND Committee

Docs: CHRIS17-4.1A Actions from the 9th WEND Committee Meeting

It was noted that Action #2 from WEND9 (ECDIS Software Testing) would be discussed in the following section of this agenda item. Regarding Action #4 (ENC production assistance and Quality Management System implementation), it was remarked that the results of the survey on QMS implementation (IHO CL 71/2004 refers), as contained in Doc. WEND9-3C, had not been given wide dissemination to MS. It was suggested and agreed that this document be distributed to MS by CL.

Outcome

- IHB to circulate Doc. WEND9-3C to IHO MS by CL. (**Action**)

CHRIS17-4.1B ECDIS Type-Approval (SHOM)

France (Ing. en chef Michel EVEN) introduced this paper by SHOM, raising the issue of ECDIS equipment that has been type approved but does not appear to perform in a satisfactory manner and is potentially unsafe. The paper suggested to complement the certification standards, as in IEC 61174, with requirements on the design and development of software, and to provide means to control their implementation.

CIRM (Mr. Tor SVANES) stated that he was not in favour of more bureaucracy on type-approval. He mentioned that the comments in the SHOM report concern only one ECDIS equipment, as installed on a certain class of Navy ships. Further, the report provides indication on why some users have problems using official ENC data because of lack of full coverage. In his view, SENC distribution could be a solution to overcome the reported problems; however this depends on HO's providing adequate ENC coverage.

Germany (Mr. Horst HECHT) expressed concern about any unsafe equipment. He suggested that France contact their national type-approval authority on this matter. He added that this appears to be a European Union issue regarding type-approval recognition. UK (Mr. Chris SMITH), while agreeing that this is a concern, felt that it is an equipment software management issue, i.e. outside the IHO scope. UK (Mr. Barrie GREENSLADE) cited examples that he has observed where ECDIS equipment did not seem to perform well, but were type-approved. In terms of testing standards, Germany (JONAS) felt that the rules for software coding might need to be stricter.

Chair summarized, as follows:

- CHRIS questions whether invoking a safety management standard and/or using aeronautical testing standards are the most appropriate mechanisms to improve ECDIS performances. Further, this is likely to result in escalating costs of ECDIS.
- At least some of the examples cited in Doc. CHRIS17-4.1B may be caused more by lack of adequate type-approval testing, according to the existing standards, rather than by lack of additional standards.
- It may be more appropriate to impose the selective use of a safety management standard, such as IEC 61508 (functional safety of software) or allied standards, on the type approval process itself. This would require discussion with the relevant authorities that control type approval processes. There would also be a cost impact on those seeking type approval.

Outcome

- CHRIS suggests the selective use of 61508, or allied standards, to augment the ECDIS type approval process be considered by the relevant authorities.
- CHRIS recommends that France uses its own relevant authorities to enforce the compliance of ECDIS with type approval standards.

4.2 3rd Extraordinary International Hydrographic Conference (EIHC)

Docs: CHRIS17-4.2A Implementation of IHO Rules for the Accreditation of NGIOs

The Chair summarized the background of how Non-Governmental International Organizations (NGIOs) are given official recognition in IHO. As such CHRIS needs to formally recognize NGIOs, and amend the Terms of Reference (TOR) for CHRIS and its Working Groups accordingly. He suggested that at this meeting, the Chairs of the various CHRIS WGs should work on modifying their TORs. The Chairman of TSMAD (Mr. Mike BROWN, USA-NOAA) would lead this effort. On request from the Secretary, the distinction between Expert Contributors and NGIOs was clarified. CIRM (Mr. Mike RAMBAUT) briefly explained how CIRM and IEC function as NGIOs at IMO, and suggested that this was applicable to IHO as well.

The Secretary collated all changes suggested on CHRIS and WGs TORs, which were reviewed in plenary. Additional amendments were proposed and the final agreed TORs are at Annex G. It was noted that the revised CHRIS TORs need approval by MS.

Outcome

- Revised TORs for CHRIS and its WGs, as at Annex G, are agreed by the Meeting.
- IHB to circulate the revised CHRIS TORs to MS by CL for approval. (**Action**)

4.3 IHO Strategic Planning WG (SPWG)

Docs: CHRIS17-4.3A rev.1 Establishment of the Hydrographic Services and Standards Committee (HSSC)

The Chair briefly explained that an outcome of the recent Extraordinary Conference (Monaco, April 2005) was to establish an IHO Hydrographic Services and Standards Committee (HSSC) to eventually replace CHRIS and other IHO technical committees and WGs. Ideally, this would come into force in 2007. He identified three issues to be considered by this meeting:

1. Seek comments / opinions from attendees on Doc. CHRIS17-4.3A.
2. Refine the proposed role / model of 3 sub-committees covering all technical aspects of IHO activities, i.e. standards, portrayal and services.
3. Contribute to an interim report to SPWG that would include draft TORs for HSSC and its subordinate organisation.

USA-NGA (Radm Christian ANDREASEN) commented that this appeared to be a change in both organization and control. UK (GREENSLADE) said that there also seemed to be more responsibility given to SCs. The Chair agreed and said that HSSC would focus more on strategic management and governance, rather than on technical work. Greece (Mr. Alexis HADJANTONIOU) pointed out that GEBCO may be a special case and that HSSC may impact on the relationship between IOC and IHO. The Chair further clarified that HSSC would deal with technical matters, whereas the other IHO committee, the Inter-Regional and Coordination Committee (IRRC), would deal with cross-organizational roles.

The Chair stated that HSSC and its subordinate bodies would act at three levels:

- Strategic: HSSC
- Coordinating: 3 Sub-committees
- Working / doing: WGs, Sub-WGs

UK (GREENSLADE) suggested it may be useful to also have an "outreach" sub-committee / WG as well. Chair agreed, in concept, and additionally suggested that a "push" of information, e.g. "IHO spam", may be useful to supplement that posted on the IHO website. Following a request from UK (Dr. Christopher DRINKWATER), the Chair indicated that he would check if a simple MS majority vote to approve new technical standards will continue with the revised IHO convention, and if a non-response by a MS will be considered a positive vote. IHB (Radm Kenneth BARBOR) pointed out that the new HSSC structure could be implemented before final ratification of the revised IHO Convention.

There was general agreement to the proposed structure for HSSC. The Meeting then broke into 4 sub-groups to work on draft Terms of Reference, as follows:

- HSSC: Led by IHB (BARBOR)
- S.C. on Symbology and Data Presentation Standards (SDPS): Led by CSPCWG Chair (Dr. Peter JONES, UK)
- S.C. on Data Acquisition and Transfer Standards (DATS): Led by TSMAD Chair (BROWN)
- S.C. on Supporting Services and Special Projects (SSSP): Led by CHRIS Vice Chair (Mr. Parry OEI, Singapore)

As a result, draft TORs were developed, then harmonized by the Chair and reviewed in Plenary. All draft TORs are contained in Annex H. These would be circulated by the Chair to CHRIS members, for final review and development of the list of current WGs and IHO publications annexed to each S.C. TOR, prior to being submitted to SPWG in December 2005.

Outcome

- Draft TORs for HSSC, DATS, SDPS and SSSP, as at Annex H, are supported by the Meeting.
- CHRIS Chair to circulate all draft TORs to CHRIS Members for final review, then to submit them to the December 2005 SPWG Meeting. **(Action)**

5 REPORTS BY CHRIS WORKING GROUPS

5.1 Transfer Standard Maintenance and Application Development (TSMAD)

Docs: CHRIS17-5.1A Report of TSMAD (M. Brown, USA-NOAA, Chair)

TSMAD Chair (BROWN) provided an overview of the activities of TSMAD. He reported that the ENC Validation Checks, as contained in IHO publication S-58, were being used in ECDIS kernels, which is not what S-58 was intended for. S-58 is intended for use solely in ENC data production, not in an ECDIS. Some ECDIS vendors seem unwilling to acknowledge this. The Chair proposed that TSMAD prepare a draft letter that would be forwarded by IHB, reminding ECDIS manufacturers and users of the purpose and proper use of S-58. Germany (HECHT) suggested that this letter also be sent to IEC, IMO, and CIRM. This was agreed.

On request from Netherlands (Ms. Ellen Vos), TSMAD Chair (BROWN) confirmed that there is a liaison with the NATO AML WG, in the frame of Work Item 2.10 (Liaison with Non-IHO Constituents). However, they appear to be leaning toward the use of the DIGEST registry approach. He also mentioned an ongoing DIGEST - S-57 harmonization effort that is being led by Canada.

The Chair added that the work of TSMAD requires considerable participation and liaison from other WGs and that IHO MS should be encouraged to be actively involved in TSMAD.

Outcome

- Report of TSMAD endorsed.
- TSMAD Chair (BROWN) to draft a letter to ECDIS manufacturers / users on the purpose and use of S-58, which will be forwarded by IHB. **(Action)**

Docs: CHRIS17-5.1B The Next Edition of IHO S-57 (4.0), Version 1.1 - March 2005
CHRIS17-5.1C The ENC Product Specification Debate
CHRIS17-5.1D ENC Product Specification Options
CHRIS17-INF3 NHS Letter to IHB on S-57 Ed. 4.0

This topic, i.e. the future of S-57 and the ENC Product Specification, was presented by the TSMAD Chair (BROWN), and discussed at length, at the ECDIS Stakeholders Workshop which took place on 6-7 September (see section 9). Regarding the ENC PS issue, Doc. CHRIS17-5.1D suggested 4 possible options, as follows:

- Option 1: Retain the current ENC PS, i.e. e3.1, with no replacement in work.
- Option 2: Develop and issue a “minor” interim version based on Edition 3.1 (i.e., 3.1.1).
- Option 3: Develop and issue a “major” interim version based on Edition 3.1 (i.e., 3.2).
- Option 4: Develop and issue a new ENC PS based on Edition 4.0.

There was general support that Option 1, i.e. doing nothing, was not acceptable. After discussion, the majority views were that:

- In the long term, a new ENC PS should be written under a new major edition of the IHO transfer standard. Its content would remain similar to e3.1 and it should be able to continue using the encapsulation standard ISO 8211, however, the new ENC PS would fit with new template and all consistency issues would have been addressed and resolved.
- In the short term, an interim edition 3.1.1 would be developed to accommodate new IMO measures that require new chart features, such as Particularly Sensitive Sea Areas (PSSA) and Archipelagic Sea Lanes (ASL). Only those additional features that are required to accommodate critical items would be taken into consideration. Provision would also be made for undefined “placeholders” in e3.1.1, for additional objects that may result from IMO decisions in future. Notices to mariners would inform users of these changes, as appropriate. The impact of e3.1.1 on e3.1 ENC encoding would also need to be considered. The work on e3.1.1 could be in at the next TSMAD Meeting in Australia in November 2005.

The Chair added that the aim is that both e3.1 and e3.1.1 ENCs can be read in an ECDIS. Workarounds in e3.1 would remain the same, i.e. e3.1.1 ENCs will only need to be produced when warranted for new features, e.g. PSSA, and for the concerned areas. ECDIS users would only see e3.1.1 data where needed for these additional objects. To a query from Norway (Mr. Ole B. KVAMME) asking if there would be two versions of the same cell, the Chair clarified that the intent is that any new e3.1.1 ENC would replace an existing e3.1 ENC. There would therefore be no need for two versions of the same cell to exist. Some updating of ENC production tools, as well as small software changes in the ECDIS to recognize these new objects, will be needed.

UK (SMITH) suggested that a CL be prepared to inform MS. The Chair concurred that this is a significant issue that needs to be made known to the wider IHO community, clearly explaining what will occur and when, and what are the benefits. Germany (HECHT) felt that regulatory bodies and user groups, e.g. ECDIS manufacturers and type-approval authorities, needed to be informed as well. He further proposed that, similar to a new edition of a paper chart, there be some enforcing of the necessary changes to ECDIS equipment to handle this “upgraded” e3.1.1 ENCs. A screen cluttered with question marks, when using e3.1.1 ENC data, would not be acceptable. However, it may take a long time for this type of mandatory change to go into effect. TSMAD Chair (BROWN) suggested that some examples (screen captures) and/or a test data set be also provided. CIRM (RAMBAUT) agreed that an IMO SN Circular on a necessary software update might be appropriate. However, as long as ECDIS is not mandatory, this SN Circular may only be advisory, although, if ECDIS is being used to satisfy SOLAS requirements, then it may be mandatory. Germany (JONAS) pointed out that any navigation devices must be kept current.

The Chair agreed that, in the long term, IMO must be informed about the need to keep computer-based equipment up-to-date. The annual re-certification of lifeboat equipment may have application to ECDIS as well, as suggested by ICCL (Mr. George ARTS). As to the question marks on the ECDIS screen, this needs to be considered in terms of e3.1.1 ENC data used in an e3.1 ECDIS, and vice-versa, and overcome eventually. It was also expected that the changes developed for the e3.1.1 ENC PS would not result in a requirement for ECDIS equipment to be re-tested for type-approval; this would however need to be verified with type-approval labs. In this regard, the Chair suggested that the latter user group be invited to attend TSMAD meetings. Following a remark by Sweden (Mr. Hans ENGBERG) that making things better is not the same as doing what is critical, the Chair pointed out the dilemma about duty-of-care vs. potential liability. The defence is that you do the best you can. There needs to be some bounds put around what is done, i.e. too much vs. too little.

Norway (KVAMME) drew attention to Doc. CHRIS17-INF3, in particular the recommendations in section 5 for consequences analysis and implementation strategy. He stressed the concerns expressed in this document, as in the past confusion has created most of the problems. In his view, the key issue at stake is to use ECDIS to avoid running aground, hoping that moving to e3.1.1 would contribute to this aim.

The Chair summarized that:

- There was general support within CHRIS for moving to an ENC PS e3.1.1.
- Instructions to TSMAD on the scope of what should be done and when (road map) were needed.
- Not all proposed items needed to be implemented.
- MS would be informed by CL; regulatory bodies and user groups would also be informed.

An outline of the e3.1.1 work plan was developed as follows:

- Identify the requirements for new objects classes, attributes and attribute values.
- Receive some guiding principles from CHRIS.
- Inform TSMAD members that they will be working on an e3.1.1 update.
- Avoid workarounds, to the greatest extent possible.
- Prepare an e3.1.1 ENC test dataset.
- Find a mechanism that allows ECDIS equipment upgraded to e3.1.1, not to be re-tested for type-approval.

Germany (HECHT) recommended that a similar detailed plan be developed for S-57 Edition 4.0.

It was agreed that the CL informing MS of e3.1.1 development would include:

- Stressing that e3.1.1 is a minor revision of the ENC PS and that there is no plan for an ENC PS e3.1.2, nor to revise the S-57 standard again.
- Explaining the relationship of e3.1.1 with S-57 Edition 4.0, and that it is a necessary step toward the latter.
- Indicating that e3.1.1, while requiring minor amendments to the Presentation Library, should not affect ECDIS type-approval.
- Highlighting the main points in Doc. CHRIS17-INF3 and stressing that this should not affect the possibility of IMO making ECDIS mandatory.

Outcome

- CHRIS Chair Group to investigate and pursue appropriate mechanisms to ensure an IMO requirement for the maintenance of the currency of ECDIS software. (**Action**)
- CHRIS endorses the development of ENC PS e3.1.1.
- CHRIS Chair Group to liaise with IHB to issue a Circular Letter informing MS and stakeholders of the development of ENC PS e3.1.1, with brief reasons and justification. (**Action**)
- TSMAD to develop e3.1.1 of the ENC Product Specification, with target date of September 2006 (CHRIS18) for completion. (**Action**)

In order to avoid continuing confusion between the S-57 Transfer Standard and the ENC Product Specification, and taking into account feedback and discussion from the ECDIS Stakeholders Forum, it was agreed that the ISO-compliant S-57 Edition 4.0, currently under development, would henceforth be known as S-100. The ENC Product Specification based on S-100 will be known as S-101. Other Product Specifications will follow in an S-10x series as they are required.

The timetable for S-100, i.e. S-57 Edition 4.0, and S-101, i.e. S-57 Edition 4.0 ENC Product Specification, was agreed as follows:

- S-100: The S-100 Transfer Standard should be available late 2007.
- S-101: The S-101 ENC Product Specification is not expected to be published before 2012.

It is intended that publishing ENCs created using the new Transfer Standard only after 2012, would ensure continued stability in the developing ECDIS market and would assist long-term planning both for HOs and the ECDIS Industry. In the meantime, early development of S-100 well ahead of the introduction of S-101 would allow a full assessment and testing to be performed.

CIRM (RAMBAUT) estimated that at least 18 months would be required from the date of publication of S-101 to when it goes into effect. Germany (HECHT) summarized that it would be a four-phases

process: 1) roll out of S-100; 2) roll out of S-101; 3) implementation of S-101; and 4) S-101 coming in force.

Outcome

- ISO-compliant S-57 Edition 4.0, currently under development, is henceforth known as S-100. The ENC Product Specification based on S-100 is designated S-101. Other Product Specifications will follow in an S-10x series as they are required.
- CHRIS endorses continuation of work on S-100 development, and commencement of work on S-101, with target dates of end 2007 and end 2012 for completion, respectively.
- CHRIS Chair Group to liaise with IHB to issue a Circular Letter informing MS and stakeholders of the impending changes related to S-100 and S-101. (**Action**)
- TSMAD to continue development work on S-100, and to commence work on S-101, with target dates of end 2007 and end 2012 for publication, respectively. (**Action**)
- TSMAD to submit an impact statement and detailed project plan for the ongoing development of S-100 and S-101, for consideration at CHRIS18. (**Action**)

5.2 Colour and Symbol Maintenance (C&SMWG)

Docs: CHRIS17-5.2A

Report of C&SMWG (M. Jonas, Germany, Chair)

C&SMWG Chair (JONAS) provided a summary of C&SMWG activities since CHRIS16. He reminded that e4.2 of the C&S Specifications (S-52 App.2) and e3.3 of the Presentation Library (PL – Annex A to S-52 App.2) were released in March 2004. Also, a revised IHO Test Data Set (TDS) was published as S-64 in December 2004. To date, approximately 40 copies of the new PL on CD-ROM had been purchased from the IHB, which seems a realistic number of companies / institutions who are commercially active in the ECDIS field. Accordingly, ECDIS manufacturers and other affected bodies have been informed by the IHB about the revised time frame for introduction of PL e3.3, as follows:

- ECDIS systems to be type-approved for the first time after 1st January 2005 must conform to Edition 3.3 of the PL from 1st July 2005.
- ECDIS systems already type-approved as of 1st January 2005 should upgrade to Edition 3.3 of the PL at the earliest opportunity, but not later than 1st January 2006.
- ECDIS systems that are already in use onboard ships should be upgraded to Edition 3.3 of the PL at the earliest opportunity.

C&SMWG Chair (JONAS) explained that PL e3.3 included approximately 25 deferred amendments, which many manufacturers had already dealt with, a reduction from 5 to 3 colour tables, new colour calibration tests for flat panels, and a new method for detection and depiction of the 'safety contour' which makes encoding of linear depth areas redundant. Regarding the latter issue, C&SMWG suggested that HOs no longer needed to provide the laborious encoding of linear depth areas from 1 January 2007 and that all new and existing ECDIS be upgraded accordingly by that date. After discussion it was agreed that, as this is not a safety critical issue, it would be re-considered at CHRIS18. Also, that there was no requirement to notify mariners at sea of the changes from PL e3.2 to PL e3.3. However, it will be necessary to do so when changes are made to accommodate S-57 e3.1.1. C&SMWG was tasked with developing symbols for the objects which will be added to the IHO Object Catalogue when upgrading from e3.1 to e3.1.1. It was decided to include these add-ons in the PL e3.3 and to postpone its implementation by one year, i.e. until the new objects and related symbols are available towards the end of 2006.

C&SMWG Chair (JONAS) reported that C&SMWG also suggested that a consultant be engaged, paid from the PL Fund, to identify which parts of the PL e3.3 would potentially be affected by a reorganisation according to ISO 19117 "Portrayal" and to give advice on the usefulness of transition of exiting PL to this standard. UK (GREENSLADE) felt that this would apply generally to S-100, i.e. all aspects of the IHO Standard, including portrayal, will be considered when aligning with the ISO 19000 series. C&SMWG Chair (JONAS) concurred and believed that the money would better be spent to

adapt the PL to S-100 rather than to ISO 19117 "Portrayal". There was general support that S-100 going ISO 19117 - compliant was a better path than looking to convert the PL to ISO 19117. A consultant will therefore not be engaged to assess the impact of moving S-52 / PL under an ISO structure. It may however be required later.

The Chair remarked that there is not a comprehensive mariners guide for ECDIS symbology and wondered if such an undertaking would be worthwhile? It would provide a paper chart – ECDIS symbology comparison and would be different from what has been published as Chart 1 in the PL e3.3. It could be similar, in concept, to what is contained in the Inland ENC Encoding Guide. UK (GREENSLADE) mentioned that there exists an "INT 1 to S57/52 for ENCs" document on the IHO website (Annex D to S57 Appendix B1), which provides a reference for interpreting the many symbols and abbreviations found on International charts into ENC objects and attributes. However, it is more intended for encoders than for users. In addition, although there is provision in this document for reference to S-52 / PL symbols, this part has not (yet) been populated. C&SMWG Chair (JONAS) noted that interrogation of symbols on ECDIS equipment is already possible and felt that the combination of INT 1, Chart 1 and the description of ECDIS symbols (PL Addendum) is sufficient. Regarding the Addendum, he suggested it be made available free of charge on the IHO website, which was accepted. He added that production of a mariners guide for ECDIS symbology would be a large undertaking for someone to do. USA (BROWN) agreed and believed that a database-encoding guide developed in association with S-100 may be a better long-term solution. The meeting agreed to not add this as a new C&SMWG work item.

C&SMWG Chair (JONAS) mentioned that S-52 currently gives only generic guidance on how a pick report should be presented on ECDIS. A number of C&SMWG contributors, particularly from type-approval bodies and customers claimed this as too weak and asked for more harmonisation of pick report presentation. It was agreed that this issue would be addressed by SNPWG.

There followed a discussion on the future on the PL. C&SMWG Chair (JONAS) presented three possible options:

- Option 1: IHO release control of the electronic chart display in full.
- Option 2: PL re-design and consolidation, through consultancy.
- Option 3: Low level maintenance of PL e3.3.

The Meeting agreed that Option 3 would apply for the time being, i.e. maintenance will be limited to minor corrections to / adaptation of the ECDIS symbology. Low-level maintenance of the S-52 / PL will include developing appropriate symbols and colours to comply with S57 e3.1.1, e.g. ASLs and PSSAs. It was acknowledged that this option accepts that the construction of the PL is no longer a modern computer chart presentation in a technical sense and will get more and more outdated over the next years.

UK (GREENSLADE) indicated that he was currently preparing a registry for S-57 / S-100 objects which will be the centralised host of all old and future objects and attributes. He suggested to enhance this registry by incorporation of an extra registry for the display / symbolization of any object. This was supported, as well as that C&SMWG will monitor the move towards symbolization Registry System

Dr. JONAS expressed his desire to eventually step down from C&SMWG Chair. He further suggested that this position could be taken over by someone from industry that is more knowledgeable about this technical field.

Outcome

- Report of C&SMWG endorsed.
- C&SMWG to reconsider the "linear depth areas" issue at its next meeting and C&SMWG Chair to prepare a paper on the matter, including proposed action, for submission to CHRIS18. (**Action**)
- C&SMWG to draft symbolisation for S-57 e 3.1.1 added objects. (**Action**)
- No support to convert the PL e3.3 to ISO 19117 "Portrayal"; the effort will focus on future adaptation of the PL to S-100.

- No support for the development of a mariners guide for ECDIS symbology.
- Format for presentation of pick reports on ECDIS to be addressed by SNPWG. (**Action**)
- IHB to make the description of ECDIS symbols (PL Addendum) available free of charge on the IHO website. (**Action**)
- C&SMWG to continue low-level maintenance of PL e3.3, including the necessary support for S-57 e3.1.1. (**Action**)
- C&SMWG to assess and monitor the move towards Symbolization Registry System. (**Action**)

5.3 Data Protection Scheme (DPSWG)

Docs: CHRIS17-5.3A Report of DPSWG (R. Sandvik, Norway-ECC, Chair)

In the absence of the DPSWG Chair (SANDVIK), the Vice Chair (SMITH) briefly summarized the report. 11 Data Servers and more than 60 OEMs were currently using the IHO data protection scheme S-63. An online S-63 ENC signature service has been established from a server installed at the IHB, thus enabling all Data Servers to sign their ENC data using a private/public key pair which could immediately be read by all compatible OEMs, i.e. we now have an operational S-63 scheme. The work of DPSWG is presently reduced to assess the operational experiences from the Data Servers and OEMs using the current regime for the distribution of protected ENCs, and their possible impact on S-63. He reported that the publication of a new ENC Product Specification based on S-57e4 / S-100 (henceforth known as S-101), will also require development of a new edition of S-63 to support it, since the new IHO transfer standard will contain a change in structure, content and encoding. The required work was estimated to take 6-12 months.

The Chair noted that some criticisms and concerns about S-63 were expressed by Industry at the ECDIS Stakeholders Forum (6-7 September 2005, in conjunction with CHRIS17 – see section 9). He asked the DPSWG Vice Chair (SMITH) to convey these criticisms / concerns to the DPSWG Chair and all DPSWG members, for review and possible action.

IHB (BARBOR) mentioned the “S-63X” initiative (an additional layer on top of S-63) that is being spearheaded by an industry group, not by an IHO body. He also reported that the proposed revision of the ECDIS Performance Standards, as contained in the Greece-IHO submission to MSC 80 (Doc. CHRIS17-6.1A – see also section 6.1) and approved by IHO Member States, includes a reference to S-63, as follows:

4.9 ECDIS should be capable of accepting an encrypted ENC and its updates conforming to the IHO Data Protection Scheme¹.

¹ IHO Special Publication S-63 (see appendix 1).

Some felt however that IHO should be in a position to explain why the above reference is needed, and how this is not a problem.

Outcome

- Report of DPSWG endorsed.
- DPSWG Vice Chair (SMITH) to convey the criticisms / concerns expressed by Industry at the ECDIS Stakeholders Forum, to the DPSWG Chair and all DPSWG members, for review and possible action. (**Action**)

5.4 Standardization of Nautical Publications (SNPWG)

Docs: CHRIS17-5.4A Report of SNPWG (J. Melles, Germany, Chair)

SNPWG Chair (Mr. Johannes MELLES, Germany) reported briefly on past year SNPWG activities. The WG meets every 6 months on average. Mr. John NYBERG (USANOA) has been nominated as the

new secretary of SNPWG and Mr. David ACLAND (UKHO) has been elected as the new vice chairman.

The data structure for NP3, i.e. nautical publications for ECDIS, will be an extension to S-57 4.0 (henceforth known as S-100), allowing users to encode NPs. UML will be used to model the data for NP3. The good support from UKHO was noted. The content of the digital nautical publications will be divided into 8 prioritised logical groups, with the first 3 groups being as follows:

- Priority 1 Marine Services
- Priority 2 Traffic Management
- Priority 3 Harbour infrastructure

Next step will be for SNPWG to produce UML models for each of the 8 groups. Regarding the presentation of NPs in ECDIS, SNPWG Chair (MELLES) felt that the investigation in NP3 display requirements was not a task for the SNPWG and suggested that this be given to C&SMWG.

Netherlands (VOS) pointed out that with Inland ECDIS there are both navigation and information modes. This influences what type of information should be displayed (text and images). C&SMWG Chair (JONAS) mentioned that his WG was looking ahead to dealing with pictorial representations (PICREP) and suggested that "guidelines" may be needed at first, rather than "standards". He felt that the best approach would be to base this development on ergonomic principles, to use SNPWG output and to get help in computer visualization. He further suggested that a university could perform this task.

The Chair concurred that developing broad guidelines, parameters and principles for NP3 presentation in ECDIS was a good idea. Rather than assigning a new task to another WG, he suggested extending the scope of the existing SNPWG's task, i.e. Task C "*Develop basic display rules for NP-data intended for use in ECDIS (NP3)*", to prepare the guideline structure for NP3 presentation, which should be broad and not prescriptive.

This was generally supported by the Meeting, as well as that the development of NP3 presentation in ECDIS would be best performed by a university, as a research project. HGMIO Chair (ALEXANDER) kindly offered to liaise with the SNPWG Chair (MELLES), to look for a suitable research project on the matter.

SNPWG Chair (MELLES) expressed concern that participation within the working group between meetings was still very poor. Most of the work was being done at meetings. In addition, the bulk of activity was being done by UKHO and BSH. He felt this was really a CHRIS work programme issue. Also, he remarked that 3 items had been left by mistake in the SNPWG ToRs, i.e. tasks iv), v) and vi) of section 4.a), and asked that they be deleted, which was accepted.

Outcome

- Report of SNPWG endorsed.
- SNPWG to develop NP3 data structure as an extension to S-100, with target date of end 2007 for completion. (**Action**)
- SNPWG to develop broad guidelines, parameters and principles for NP3 presentation in ECDIS, in execution of Task C of the SNPWG WP. (**Action**)
- SNPWG Chair (MELLES), in liaison with HGMIO Chair (Alexander), to seek assistance from academia and industry in developing appropriate standards and guidelines for NP3 presentation, through a suitable research project. (**Action**)
- Deletion of tasks iv), v) and vi) in section 4.a) of SNPWG ToRs accepted.
- CHRIS Members to encourage their representatives in SNPWG to participate and contribute more actively between meetings. (**Action**)

5.5 Chart Standardization and Paper Chart (CSPCWG)

- No need for additional guidelines to those in Docs. CHRIS17-6B and 6C.
- CHRIS Work Plan 1.5, as in Annex I, endorsed.
- CHRIS Chair and Secretary to review and streamline the CHRIS Work Plan format. **(Action)**
- CHRIS Chair to provide the current work plan to WG Chairs for review, prior to CHRIS18. **(Action)**

6.1 Re-structuring the S-52 Package

Docs: CHRIS17-6.1A Greece-IHO Submission to MSC 80 on amending the PS for ECDIS

Greece (HADJANTONIOU) explained some of the background regarding this submission. It resulted from the IHO work on revising S-52 (Actions 5.1 and 5.2 from CHRIS16). The draft submission to IMO-MSC, proposing amendments to the ECDIS Performance Standards, was circulated to IHO Member States by CL 69/2004 and was largely supported by MS, as reported in CL 5/2005. Following recommendation by the IMO Secretariat that an IMO Member State be associated in the submission to MSC, Greece (IMO MS) kindly agreed to jointly submit this paper with the IHO.

The Chair explained that an IMO Correspondence Group (CG) on evaluation of the use of ECDIS and ENC Development had been set up by IMO NAV51 (June 2005). Revision of the IMO PS for ECDIS was on the CG agenda and the Greece-IHO submission, as in CHRIS17-6.1A, was one of the documents to be considered by the CG in this exercise. He felt that, as a result of this paper and subsequent developments, there was an opportunity for IHO to submit further recommendations and he asked whether a supplementary IHO submission should be made to IMO on the matter?

The discussions which followed revealed that there was no support for such additional paper which, at this time, could even be counter-productive.

Outcome

- No need for additional IHO submission to IMO on revising the ECDIS Performance Standards.

6.2 Printed ENCs

USA-NOAA (Mr. Dave ENABNIT) reported that a preliminary study had been conducted on this issue, but a comprehensive analysis was not completed. This was being done by a commercial company (LaserScan) under contract to NOAA and NGA.

Outcome

- USA-NOAA to report progress on "Printed ENCs" to CHRIS18. **(Action)**

6.3 Print-on-Demand

Docs: CHRIS17-6.3A Print on Demand Nautical Charts Status in the U.S.A (NOAA)

USA-NOAA (ENABNIT) provided a brief overview on this issue. He reported that, in the USA, print-on-demand charts now represent 25% of the market for printed NOAA charts.

Outcome

- Report noted.

7. MARINE INFORMATION OBJECTS (MIO)

Docs: CHRIS17-7A
CHRIS17-7B

Report of HGMIO (L. Alexander, USA-UNH, Chair)
Proposal for a New Work Item for HGMIO: Aids to Navigation Status (IHB)

HGMIO Chair (ALEXANDER) gave a brief report. Of particular note, he mentioned that:

- HGMIO is a very small group, but there is good participation by few. Last meeting was in June 2005.
- Good progress is being made on Coral Reef habitat as a PSSA, under NOAA leadership. New biological and regulatory S-57 objects / attributes are under development.
- A new Work Item "Aids to Navigation Status" is proposed for HGMIO (see Doc. CHRIS17-7B). This task would be performed jointly by HGMIO and IALA. It results from an IALA "e-ANSI" project to transmit to ships at sea the status of Aids to Navigation (AtoN) and display this information on ECDIS, with AtoN status forming an MIO layer on top of the ENC. The Meeting approved the proposed new Work Item.
- "Recommended Procedures for the Development of MIOs" have been prepared, which describe the various steps of MIO development (see Annex to DocCHRIS17-7A). The Meeting endorsed this document.

Netherlands (VOS) asked about IHO level of involvement in development of tide / water level displays. HGMIO Chair (ALEXANDER) explained that while adjusting an ENC display is not permitted in S-57, this is something that is being addressed by both HGMIO and the S-57 Ed. 4.0 / S-100 Sub-WG.

Outcome

- Report of HGMIO endorsed.
- New Work Item for HGMIO "Aids to Navigation Status" approved.
- "Recommended Procedures for the Development of MIOs", as in Annex to CHRIS17-7A, endorsed.

8. OPEN ECDIS FORUM

Docs: CHRIS17-8A

Report on OEF Activities (L. Alexander, USA-UNH)

Dr. ALEXANDER gave a brief summary of OEF activities. He reported that, more than being primarily a discussion and information site, the OEF has become a means for consensus building and facilitating a range of topics related to ECDIS development and implementation, as well as a site to register and list such ECDIS-related matters as S-57 / S-100 data producer codes and new S-57 / S-100 objects & attributes. He highlighted the followings:

- The OEF now serves as a register for S-57 data producer codes (private companies and non-IHO international organizations), the ENC producer codes being contained in IHO S-62.
- The OEF serves as a register for new S-57 objects / attributes, and will conform to the new IHO S-57 Ed. 4.0 / S-100 Registry.
- The OEF is hosted by the University of New Hampshire, USA, and is undergoing an upgrade / modernization.
- The current OEF Board of Advisors comprises:
 - o RAdm Ken BARBOR as Director, IHB
 - o Capt. Robert WARD (Australia) as Chair, IHO CHRIS
 - o Mr. Mike BROWN (USA-NOAA) as Chair, IHO TSMAD
 - o Dr. Lee ALEXANDER CCOM-JHC, University of New Hampshire, USA
 - o Mr. Gert BÜTTGENBACH SevenCs, Germany (and Founder of OEF)
 - o Mr. Mizuho KATAYAMA Marine Counsellor, Japan
 - o Peter KLUYTENAAR Serendipity Unltd. (Nautical Consultant) and Technical Advisor - European Inland ECDIS Committee

Additionally, Ing. en chef Michel HUET (IHB) and Mr. Tony PHARAOH (IHB) will act as Technical Advisors to the OEF.

HGMIO Chair (ALEXANDER) also reported that, earlier in 2005, the IHB provided \$10,000US to support the operation of the OEF and he hoped that this level of support could be provided on an annual basis. The Meeting recommended that IHB continue to financially support the OEF.

Outcome

- Report on OEF noted.
- CHRIS recommends that IHB continue to financially support the OEF on an annual basis at same level as in 2005.
- IHB to reflect annual support of OEF in IHO budget. **(Action)**

9. LIAISON WITH INDUSTRY

Docs: CHRIS17-9A ECDIS Stakeholders' Forum - Programme

As a follow-on from the "Industry Days" that in previous years took place at the IHB in Monaco, an ECDIS Stakeholder's Forum was held on 6-7 September 2005, in conjunction with CHRIS17, with 74 persons in attendance, including 32 "industry" representatives and the 42 participants in CHRIS17. The meeting was chaired by Capt. Robert WARD, Chairman of CHRIS. The list of participants and the programme are provided at Appendices 1 and 2 of Annex J, respectively. Like at the past "Industry Days", this meeting provided an excellent opportunity to discuss important issues between the IHO representatives and those involved in ECDIS manufacturing, data distribution, data validation and data production software developers, as well as representatives of other organizations representing the interests of the ECDIS user.

The programme showed two major items for which the input, co-operation and support of the stakeholders were essential to reach a successful solution. The first issue being the future of the IHO Transfer Standard S-57 and of the ENC Product Specification, and the second issue being the implementation of new editions of the IHO Colour and Symbol Specifications, S-52 Appendix 2, and its Annex A, the IHO Presentation Library for ECDIS, both released in March 2004. The Chair explained that the meeting was a forum for discussion, and not a decision-making body. It should provide a constructive exchange of views on issues related to ECDIS standards.

All relevant issues were discussed extensively. The input from ECDIS stakeholders was extremely useful and beneficial for CHRIS to work out solutions to the problems at stake. The outcomes from the forum were taken into consideration in the subsequent discussions on these issues by CHRIS17, which resulted in better-informed decisions and recommendations, as reflected in sections 5.1 and 5.2 of these minutes. A summary of the discussions held at the ECDIS Stakeholders Forum and prepared by Mr. Cor MALLIE, Chartworr Holland BV, is provided at Annex J.

The majority of the Stakeholders expressed the wish that the next meeting be in conjunction with a meeting of the WEND Committee. This would enable them to voice their concerns about the quality and quantity of ENC and other pressing issues from the user perspective like licensing and pricing, distribution, a proper loading strategy and discuss possible ways to improve the present situation.

Outcome

- All relevant issues were discussed extensively. Stability of the ENC Product Specification was stressed. Early forecast of S-57 development is essential.
- IHB to programme the next ECDIS Stakeholders Forum in conjunction with the 10th WEND Committee Meeting. **(Action)**

10. VECTOR DATA DEVELOPMENT

10.1 RENCs

Docs: CHRIS17-10.1A *PRIMAR-Stavanger Status Report*
 CHRIS17-10.1B *IC-ENC Status Report*
 CHRIS17-10.1C *Virtual RENC in the Mediterranean and Black Sea Region – Status Report (Italy)*

There was no presenter for the P-S report which was noted.

Mr. Graham REEKS (IC-ENC) provided an update on IC-ENC activity. IC-ENC now has agreements with 18 member nations, with Argentina, Australia, Chile, Iceland, Mexico, Mozambique and Turkey being added in the last year. A 2nd regional co-ordinating centre (“icicle”), operated by the Australian H.S. has been set up. IC-ENC has a central and independent office conducting validation, to apply a final independent quality assurance process, prior to ENC release, to ensure the supply of high quality consistent data to end users. They deliver their ENC database to the market through specialist distributors, known as Value Added Resellers (VARs). They now have 1,173 ENC cells, grouped into 617 “paper chart equivalent” units, available to the market. Sales have continued to grow at an annual rate of over 300% over the past year. However, IC-ENC remains concerned about the relatively slow uptake in ENCs and fully supports the work of the WEND Task Group, the WEND Principles and the encouragement to ENC producer nations to join one of the existing RENCs.

Australia (WARD) commented that the effort required to establish the “icicle” was primarily to set up a server and suitable bandwidth, and to install some software. Not having to start from scratch to establish a RENC was substantial.

Italy (Cdr. Massimiliano NANNINI) gave a brief overview of the virtual RENC and MedChartNet projects in the Mediterranean. The Italian HO, as MBSVRENC Coordinating Center, is implementing a "Quality Assurance and Data Consistency MBSVRENC Department" in Genoa, where they will perform a complete and independent ENC quality assurance. They currently have 140 ENCs commercially available. Regarding MedChartNet, training courses have been held in 2003 and 2004 at IMA (Trieste, Italy) on ENC Production, Validation, Updating and Distribution. Also, two tenders have been made for the supply of hardware & software, and for the production of ENCs, respectively. These operations are in progress.

Outcome
 - Reports noted.

10.2 ENC Development and Coverage

Docs: CHRIS17-10.2A *ENC and IENC Production and Distribution Status in the USA (NOAA)*
 CHRIS17-10.2B *ENC Production and Distribution Status in Portugal*
 CHRIS17-10.2C *ENC Production and Distribution Status in France*
 CHRIS17-10.2D *National Report on Electronic Chart Production & Distribution in South Africa*

Brief overviews were provided on ENC production in the USA (ENABNIT), France (EVEN) and South Africa (Capt. Abri KAMPFER). There was no presenter for Portugal.

On request from the Chair, USANOAA (ENABNIT) explained how the “official re-distributor” program that has recently been established will work.

Outcome
 - Reports noted.

10.3 DNC Development

Docs: CHRIS17-10.3A

Status Report on DNC Development (USA-NGA)

USA-NGA (ANDREASEN) provided a brief overview. The Chair noted that there appears to be some resolution about the digital print files and that the improved GPS accuracy may have an impact on the use of hydrographic products.

Outcome

-Report noted.

10.4 Inland ECDIS

Docs: CHRIS17-10.4A

Status Report on Inland ECDIS development and Standardization (L. Alexander, USA-UNH)

Mr. Bernd BIRKLHUBER (Ministry of Transport - Austria) provided a brief overview on Inland ENC (IENC) Development and Standardization activity in Europe and North America. An Inland ENC Harmonization Group (IEHG) has been set up. They intend to develop an Inland ENC Product Specification, based on S-57 / S-100, as a separate application "profile" consisting of a feature catalogue, an application schema, and encoding. Also, there will be a separate register for specific Inland ENC features.

To a query by IHB (HUET) asking if there is a type-approval process for Inland ECDIS, Mr. Birkhuber answered that, in Europe, it depends on the type of system and the planned mode of operations. In North America, most of the systems are ECS and, therefore, there is no type approval.

The Chair noted that the IEHG was willing to serve as a test bed for the ISO-compliant S-57 Ed. 4.0 / S-100 framework. This would be beneficial since IENC is already an operational system. He also wondered what was the motivation for the high level of participation by industry in IENC? Mr. Birkhuber clarified that Industry is actively involved because there is cooperation and they see a market.

The Meeting welcomed the active cooperation and involvement of IEHG, particularly in relation to exercising the new ISO-compliant transfer standard S-100. TSMAD Vice Chair (GREENSLADE) encouraged the attendance of IEHG representatives at the 10th TSMAD Sub-Group meeting in Brest, France (15-19 May 2006). Participation of manufacturers would be welcome as well. The Chair concurred that IEHG should actively participate in the TSMAD developments, i.e. S-100 and S-101.

Outcome

-Report on Inland ECDIS noted.

- IEHG is willing to serve as a test bed for S-100 framework.

- IEHG to be more actively involved in the development of S-100 and S-101. TSMAD Chair (BROWN) to invite IEHG to participate in relevant TSMAD activities. (**Action**)

11. RASTER DATA DEVELOPMENT

Docs: CHRIS17-11A

RNC Production and Distribution Status in the USA (NOAA)

USA-NOAA (ENABNIT) provided a brief report. Production of official RNCs and weekly updates in the USA are and will continue to be produced by Maptech, Inc. under contract to NOAA. Charts will be available in BSB and GeoTIFF formats. The Office of Coast Survey (of NOAA) intends to distribute the RNCs and updates for free over the Internet in the same manner they distribute ENCs. The free RNC download site can be accessed from the Office of Coast Survey homepage <http://NauticalCharts.NOAA.gov>.

The Chair remarked that Agenda Items 10 “Vector Data Development” and 11 “Raster Data Development” have been long-standing CHRIS items that really more relate to WEND. He suggested that, in future, these be replaced with a single Agenda Item “Summary of Digital Data Availability” where IHB, RENCs and HOs could submit reports. This was agreed.

Outcome

- Report on raster data development noted.
- CHRIS Secretary to ensure that, from CHRIS18 a single agenda item “Summary of Digital Data Availability” will replace the existing “Vector Data Development” and “Raster Data Development”. “Inland ECDIS” will stand as a separate item. **(Action)**

12. LIAISON WITH OTHER GROUPS

12.1 ISO-TC211 (Geographic Information-Geomatics)

Docs: CHRIS17-12.1A Report on TC211 Activities affecting CHRIS (IHB)
CHRIS17-INF4 Draft IHO-ISO Memorandum of Understanding

IHB (BARBOR) provided a brief summary of IHO–ISO cooperation. ISO-TC211 provides a framework for the development of sector-specific applications using geographic data. Their standards are being used extensively for hydrographic applications such as the development of S-100.

IHB (BARBOR) also presented a draft ISO-IHO Memorandum of Understanding (MoU – Doc. CHRIS17-INF4), which was derived from a Cooperative Agreement previously agreed at CHRIS14 (Shanghai, China, 2002). He requested CHRIS to endorse the draft MOU, which was agreed.

Outcome

- Report on ISO-TC211 noted.
- Draft ISO-IHO MoU endorsed.
- IHB to circulate the draft ISO-IHO MoU to Member States for comments / approval. **(Action)**

12.2 NATO-DGIWG (Digital Geographic Information W.G.)

Docs: CHRIS17-12.2A Draft Cooperation Agreement Between the IHO and the DGIWG

IHB (BARBOR) provided a brief overview. IHO and DGIWG standards for digital geospatial information were developed at about the same time from slightly different perspectives. Hence, there are differences in how these two sets of standards encode and portray hydrographic information. He requested endorsement of the draft DGIWG-IHO Cooperation Agreement (CA) in Doc. CHRIS17-12.2A, to formalize a long history of cooperation between the two organizations to harmonize their respective standards.

Review of the draft CA raised the following comments / issues:

- CA, para. 8 – The Chair remarked that amendments to the agreement cannot be performed by CHRIS, only by IHO.
- Appendix A to CA, para. 2 – The Chair pointed out that Membership for the Hydrographic Interoperability Harmonisation Working Group (HIHWG) appears to be restricted to “Atlantic nations”, and not all IHO MS, which is not acceptable.
- Appendix A to CA, para. 3b “Exclusions” - Australia (Mr. Gordon HOMES) asked why climatology was not included with AMLs? TSMAD Vice Chair (GREENSLADE) would investigate.

As a result, CHRIS could not endorse the document as it currently stood. IHB would clarify the above points, then circulate the revised draft CA to MS.

Outcome

- Report on DGIWG-IHO cooperation noted.
- Draft DGIWG-IHO CA not endorsed.
- IHB to clarify the points raised at CHRIS18, then circulate the draft DGIWG-IHO CA to Member States for comments / approval. **(Action)**

12.3 IEC-TC80-WG7 (ECDIS/ECS)

Docs: CHRIS17-12.3A rev.1 Status of the Standard IEC 62376 "Electronic chart systems (ECS) for small craft and non-SOLAS convention craft – Minimum operational and performance requirements, methods of testing and required test results" (July 2005) (USA-NOAA)

USA-NOAA (ENABNIT) briefly described his involvement with IEC-TC80-WG7 (ECS). WG7 (ECS) is developing an IEC standard 62376 for ECS, which may be used by Administrations to support the carriage of electronic charts where ECDIS is not specified. Potentially, an ECS certified with IEC 62376 may become a backup for ECDIS. Target completion date for publication of IEC 62376 is December 2006.

The Chair suggested, and this was agreed, that MS take note of the implications of this standard related to regulating ECS.

Outcome

- Report on IEC-TC80-WG7 (ECS) noted.
- IHO MS to take note of the implications of the standard IEC 62376, related to regulating ECS. **(Action)**

12.4 IMO

Docs: CHRIS17-12.4A Report on IMO Activities

IHB (BARBOR) provided a brief overview of IHO's involvement with IMO. ENC coverage has been an issue in terms of making ECDIS a mandatory carriage requirement. The ENC / RNC / INT Chart Catalogue that will be set up by IHB is in response to this.

There followed a discussion on the revision of the IMO Performance Standards for ECDIS (see also section 6.1), which will be on the agenda of NAV 52 (17-21 June 2006). The Chair mentioned that the Greece-IHO submission to MSC 80, although it was an information paper, had galvanized interest in revising the ECDIS PS, with Russia and Norway submitting papers as well, which had resulted in NAV 51 setting up a correspondence group on ECDIS / ENC matters. He was concerned that IHO may be left out of any appropriate changes and felt that there may be an opportunity for IHO to participate. CIRM (RAMBAUT) confirmed that NAV 52 would deal with two main issues related to ECDIS, i.e. ECDIS carriage requirements, and changes to the ECDIS PS. He also explained that IEC-TC80-WG13 was working on harmonizing the display of navigation information, which could possibly impact on the ECDIS PS. Germany (JONAS) reminded that the IMO PS for ECDIS are intended for safety of navigation, whereas the IHO role is primarily related to chart-related matters.

As stated in section 6.1, it was finally agreed that there was no need at this time for additional IHO submission to IMO on revising the ECDIS PS. However, MS should inform and support their own governments on this issue.

Outcome

- Report on IHO interaction with IMO noted.
- IHO MS to inform and support their own governments on the issue of revising the IMO Performance Standards for ECDIS. (**Action**)

13. ANY OTHER BUSINESS

13.1 Review of Information Papers

Docs: CHRIS17-INF1 Status of IHO Publications on ECDIS (IHB)
CHRIS17-INF2 ENC and Spatial Data Infrastructures (SDI) (IHB)
CHRIS17-INF5 Draft IHO-IEC Memorandum of Understanding

The above papers were noted. Regarding CHRIS17-INF2, UK (GREENSLADE) commented that there is expertise in Cuba on SDI that IHO should be able to benefit from. IHB (BARBOR) invited suggestions from CHRIS on the draft IEC-IHO MoU in CHRIS17-INF5 which, he mentioned, was tailored after the ISO-IHO MoU. HGMIO Chair (ALEXANDER) offered to provide any comments directly to the IHB, including possible impact on ToRs for HGMIO.

Outcome

- Information papers noted.
- HGMIO Chair (ALEXANDER) to provide the IHB with any comments on the draft IEC-IHO MoU, as contained in Doc. CHRIS17-INF5. (**Action**)
- IHB to finalize the draft IEC-IHO MoU, then circulate it to Member States for comments / approval. (**Action**)

13.2 Port Security Limits

Docs: CHRIS17-13.2A rev.1 Charting of Port Security Limits (IHB)

IHB (BARBOR) provided a brief overview on this issue. According to Action 14 from CHRIS16, the IHB had polled MS on whether port security zones and limits should be charted and how. Survey results have shown that there is little support for including this information on paper charts. In effect 16 MS, out of 35 responses, are in favour of showing port security limits on charts whereas 27 MS support their description in nautical publications. Some concern was expressed about how the questions were phrased, and that this may have influenced the responses that were received. HGMIO (ALEXANDER) mentioned that this topic was discussed at HGMIO3 (June 2005). However, unless there is a formal request (e.g., IHO, IEC, IALA, or IMO), no work is planned by HGMIO on the matter.

Outcome

- Report noted. No action required.

14. DATE AND LOCATION OF NEXT MEETING

Following kind invitation by the Australian Hydrographic Service, it was agreed that the 18th CHRIS Meeting will take place 26-29 September 2006 in Australia, probably in Sydney. It will be preceded by a CHRIS chair group coordination meeting on 25 September.

For 2007, UK (Dr. Peter COX) offered to co-host the 19th CHRIS Meeting with the Netherlands, in conjunction with Europort 2007. There was also mention of the benefits / merits of holding CHRIS meetings in other regions of the world, e.g. South America or South East Asia.

In his closing remarks, the Chair thanked all participants and the BSH as host, and indicated that he will have to retire from the Australian Navy in 2006, and may therefore step down from CHRIS after CHRIS18. Also, TSMAD Chair (BROWN) informed that he will leave TSMAD at the end of 2006.

The meeting closed at 14:00 on 9 September 2005.

LIST OF ACRONYMS

AIS	Automated Identification System
AML	Additional Military Layer (DGIWG)
ASL	Archipelagic Sea Lane
ATBA	Area To Be Avoided
BSH	Bundesamt für Seeschifffahrt und Hydrographie (Germany)
CA	Cooperation Agreement
CCOM-JHC	Center for Coastal and Ocean Mapping – Joint Hydrographic Center (Univ. of NH, USA)
CG	Correspondence Group (IMO)
CHRIS	Committee on Hydrographic Requirements for Information Systems (IHO)
CIRM	Comité International Radio Maritime
CL	Circular Letter (IHO)
C&SMWG	Colour and Symbol Maintenance Working Group (IHO)
CSPCWG	Chart Specification and Paper Chart Working Group (IHO)
DATS	SC on Data Acquisition and Transfer Standards (IHO)
DGIWG	Digital Geographic Information Working Group (NATO)
DIGEST	Digital Geographic Information Exchange Standard (DGIWG)
DNC	Digital Nautical Chart (USA-NGA)
DPSWG	Data Protection Scheme Working Group (IHO)
ECDIS	Electronic Chart Display and Information System
ECS	Electronic Chart System
EIHC	Extraordinary International Hydrographic Conference (IHO)
ENC	Electronic Navigational Chart
ENC PS	ENC Product Specification
ESSA	Environmentally Sensitive Sea Area
GPS	Global Positioning System
HGMIO	Harmonizing Group on Marine Information Objects (IHO-IEC)
HIHWG	Hydrographic Interoperability Harmonisation Working Group (DGIWG-IHO)
HO	Hydrographic Office

HP	High Priority
HS	Hydrographic Service
HSSC	Hydrographic Services and Standards Committee (IHO)
IALA	International Association of Lighthouse Authorities
IC-ENC	International Centre for Electronic Navigational Charts (RENC)
IEC	International Electrotechnical Commission
IEHG	Inland Enc Harmonization Group
IHB	International Hydrographic Bureau (IHO)
IHO	International Hydrographic Organization
IMO	International Maritime Organization
IMO PS	IMO Performance Standards for ECDIS
IRRC	Inter-Regional and Coordination Committee (IHO)
ISO	International Organization for Standardization
LP	Low Priority
MBSVRENC	Mediterranean and Black Seas VRENC
MedChartNet	Mediterranean Charting Network (EU)
MIO	Marine Information Object (IHO)
MoU	Memorandum of Understanding
MP	Medium Priority
MS	Member State
MSC	Maritime Safety Committee (IMO)
NAV	SC on Safety of Navigation (IMO)
NATO	North Atlantic Treaty Organization
NGA	National Geospatial intelligence Agency (USA)
NGIO	Non-Governmental International Organization (IHO)
NOAA	National Oceanic and Atmospheric Administration (USA)
NP	Nautical Publication
NP2	Digital Nautical Publications (IHO)
NP3	Digital Nautical Publications for ECDIS (IHO)
OEF	Open ECDIS Forum

PL	Presentation Library (IHO)
PoD	Print-on-Demand
P-S	Primar-Stavanger (RENC)
PSSA	Particularly Sensitive Sea Area
RCDS	Raster Chart Display System (IHO-IMO)
RENC	Regional ENC coordinating centre (IHO)
RHC	Regional Hydrographic Commission (IHO)
RNC	Raster Navigational Chart
RTCM	Radio Technical Committee on Maritime Services (USA)
S-32	IHO Hydrographic Dictionary
S-57	IHO Transfer Standard for Digital Hydrographic Data
S-58	IHO Recommended ENC Validation Checks
S-62	IHO ENC Producer Codes
S-63	IHO Data Protection Scheme
S-100	IHO Transfer Standard for Digital Hydrographic Data (next major edition)
S-101	IHO ENC Product Specification based on S -100
SC	Sub-Committee
SCAMIN	Scale Minimum (IHO/S-57)
SDPS	SC on Symbology and Data Presentation Standards (IHO)
SENC	System Electronic Navigational Chart
SHOM	Service Hydrographique et Océanographique de la Marine (France)
SOLAS	UN Convention on the Safety Of Life At Sea (IMO)
SPWG	Strategic Planning Working Group (IHO)
SNPWG	Standardization of Nautical Publications Working Group (IHO)
SSSP	SC on Supporting Services and Special Projects (IHO)
TC211	Technical Committee 211 (ISO)
TG	Task Group
ToR	Terms of Reference
TSMAD	Transfer Standard Maintenance and Application Development Working Group (IHO)
UKHO	United Kingdom Hydrographic Office

UML	Unified Modelling Language
UNCLOS	United Nations Convention on the Law Of the Sea
UNIV. of NH	University of New Hampshire (USA)
USCG	United States Coast Guard
VAR	Value Added Reseller (IC-ENC)
VRENC	Virtual RENC
VTS	Vessel Traffic Service
WEND	Committee on the Worldwide ENC Data Base (IHO)
WG	Working Group
WP	Work Plan

LIST OF DOCUMENTS

CHRIS17-1A rev.16	List of Documents
CHRIS17-1B rev.10	List of Participants
CHRISWG-MEM (Aug 05)	Membership of CHRIS related WGs
CHRIS -MEM (Aug 05)	CHRIS Membership
CHRIS17-2A rev.14	Agenda
CHRIS17-3A	Minutes of CHRIS/16
CHRIS17-3B rev.1	Status of Actions List from CHRIS/16
CHRIS17-3C rev.2	Terms of Reference for CHRIS Committee and related Working Groups
CHRIS17-4.1A	Decisions of the 9 th WEND Committee Meeting
CHRIS17-4.1B	ECDIS Type-Approval (SHOM)
CHRIS17-4.2A	Implementation of IHO Rules for the Accreditation of NGO's
CHRIS17-4.3A rev.1	Establishment of the Hydrographic Services and Standards Committee (HSSC)
CHRIS17-5.1A	Report of TSMAD (M. Brown, USA-NOAA, Chair)
CHRIS17-5.1B	The Next Edition of IHO S-57 (4.0), Version 1.1 - March 2005
CHRIS17-5.1C	The ENC Product Specification Debate
CHRIS17-5.1D	ENC Product Specification Options
CHRIS17-5.2A	Report of C&SMWG (M. Jonas, Germany, Chair)
CHRIS17-5.3A	Report of DPSWG (R. Sandvik, Primar-Stavanger, Chair)
CHRIS17-5.4A	Report of SNPWG (J. Melles, Germany, Chair)
CHRIS17-5.5A	Report of CSPCWG (P. Jones, UK, Chair)
CHRIS17-5.5B	Proposed Revised Terms of Reference for CSPCWG
CHRIS17-6A rev.1	Consolidated CHRIS Work Plan, Version 1.5
CHRIS17-6B	Guidelines for the Submission of Reports and Proposals for Consideration by CHRIS and CHRIS Subsidiary Bodies, Version 1.1 – January 2005
CHRIS17-6C	Guidelines for the Evaluation of Proposed New work Items for CHRIS and CHRIS subsidiary bodies, Version 1.1 – January 2005
CHRIS17-6D	Worked Example of the Use of the Templates (CHRIS Chair & Secretary)
CHRIS17-6.1A	Greece-IHO Submission to MSC 80 on amending the PS for ECDIS
CHRIS17-6.3A	Print on Demand Nautical Charts Status in the U.S.A. (NOAA)
CHRIS17-7A rev.1	Report of IHO-IEC Harmonizing Group on Marine Information Objects (HGMIO) (L. Alexander, USA-UNH, Chair)
CHRIS17-7B	Proposal for a New Work Item for HGMIO: Aids to Navigation Status (IHB)
CHRIS17-8A	Report on Activities of the Open ECDIS Forum (OEF) (L. Alexander, USA-UNH)
CHRIS17-9A	ECDIS Stakeholders' Forum - Programme
CHRIS17-10.1A	PRIMAR Stavanger Status Report (R. Sandvik, Primar Stavanger)

CHRIS17-10.1B	IC-ENC Status Report (G. Saunderclock, IC -ENC)
CHRIS17-10.1C	Virtual RENC in the Mediterranean and Black Sea Region – Status Report (Italy)
CHRIS17-10.2A	ENC and IENC Production and Distribution Status in the USA (NOAA)
CHRIS17-10.2B	ENC Production and Distribution Status in Portugal
CHRIS17-10.2C	ENC Production and Distribution Status in France
CHRIS17-10.2D	National Report on Electronic Chart Production Distribution in South Africa
CHRIS17-10.3A	Report on DNC Development (C. Andreasen, USA-NIMA)
CHRIS17-10.4A	Status Report on Inland ECDIS development and Standardization (L. Alexander, USA-UNH)
CHRIS17-11A	RNC Production and Distribution Status in the USA (NOAA)
CHRIS17-12.1A	Report on ISO/TC 211 Activities affecting CHRIS (IHB)
CHRIS17-12.2A	Draft Cooperation Agreement Between the IHO and the DGIWG
CHRIS17-12.3A rev.1	Status of the Standard IEC 62376 “Electronic chart systems (ECS) for small craft and non-SOLAS convention craft – Minimum operational and performance requirements, methods of testing and required test results” (July 2005) (USA-NOAA)
CHRIS17-12.4A	Report on IMO Activities
CHRIS17-13.2A rev.1	Charting of Port Security Limits (IHB)
CHRIS17-INF1	Status of IHO publications on ECDIS (IHB)
CHRIS17-INF2	ENCs and Spatial Data Infrastructures (SDI) (IHB)
CHRIS17-INF3	NHS Letter to IHB on S-57 Ed. 4.0
CHRIS17-INF4	Draft IHO-ISO Memorandum of Understanding
CHRIS17-INF5	Draft IHO-IEC Memorandum of Understanding

LIST OF PARTICIPANTS

Country	Name of Member	Email
Australia	Robert E. WARD (Chair) Gordon HOMES	robert.ward@hydro.gov.au gordon.homes@defence.gov.au
Canada	Don VACHON	VachonD@dfo-mpo.gc.ca
China	CHAU Chun Ming	Michael@hydro.gov.hk
Estonia	Tonis SILLARANUSK	tonis.sillanarusk@vta.ee
Finland	Tiina TUURNALA Juha KORHONEN	Tiina.Tuurnala@fma.fi Juha.Korhonen@fma.fi
France	Michel EVEN	even@shom.fr
Germany	Horst HECHT Mathias JONAS (C&SMWG Chair) Johannes MELLES (SNPWG Chair)	Horst.Hecht@bsh.de Mathias.Jonas@bsh.de Johannes.Melles@bsh.de
Greece	Alexis HADJANTONIOU	dcd@hnhs.gr
Italy	Massimiliano NANNINI	nanninim@marina.difesa.it
Japan	Toru KAJIMURA Shigeshi MIMURA	tooru-kajimura@kaiho.mlit.go.jp mimura@jha.jp
Korea (Rep. of)	Wonkyung KIM Jinwang BOUK Jongmin PARK	wkkim@nori.go.kr jgbok@nori.go.kr pjm@kriso.re.kr
Netherlands	Ellen VOS Jan SCHAAP	em.vos@mindef.nl j.schaap2@mindef.nl
New Zealand	Michael FARRELL	mfarrell@linz.govt.nz
Nigeria	Ayo OLUGBODE	molugbode@yahoo.com
Norway	Ole B. KVAMME	Ole.b.Kvamme@statkart.no
Singapore	Parry OEI (Vice Chair)	parry@mpa.gov.sg
South Africa	Abri KAMPFER	hydrosan@iafrica.com
Spain	Angel CHANS	ihmesp@retemail.es
Sweden	Peter SUNDBERG Hans ENGBERG	peter.sundberg@sjofartsverket.se hans.engberg@sjofartsverket.se
Thailand	Katanyu SRITANGNAN	hydrotech@navy.mi.th
UK	Chris SMITH Peter JONES (CSPCWG Chair) Barrie GREENSLADE (TSMAD Vice Chair) Peter COX Chris DRINKWATER	Chris.Smith@ukho.gov.uk Peter.Jones@ukho.gov.uk Barrie.Greenslade@ukho.gov.uk Peter.Cox@ukho.gov.uk chrisdrinkwater@btinternet.com
USA (NGA)	Christian ANDREASEN	AndreasenC@nga.mil
USA (NOAA)	Dave ENABNIT Michael BROWN (TSMAD Chair) Julia POWELL	Dave.Enabnit@noaa.gov Mike.Brown@noaa.gov Julia.Powell@noaa.gov

Country	Name of Member	Email
USA (USCG)	James RADICE	James.T.Radice@uscg.mil

<i>IHB</i>	Name	Email
	Kenneth BARBOR (IHB Director) Michel HUET (Secretary)	kbarbor@ihb.mc mhuet@ihb.mc

Observers	Name	Email
CIRM	Michael RAMBAUT Tor SVANES	secgen@cirm.org svanes@c-map.no
ICCL	George ARTS	George.arts@marinepress.com
IC-ENC	Graham REEKS	graham.reeks@ic-enc.org
OEF & HGMIO	Lee ALEXANDER (HGMIO Chair)	Lee.Alexander@unh.edu
RTCM	Gwil ROBERTS	gwilr@iictechnologies.com
IEHG	Bernd BIRKLHUBER	bernd.birkhuber@bmvit.gv.at

AGENDA

1. **Opening and Administrative Arrangements**
Docs: CHRIS17-1A List of Documents
CHRIS17-1B List of participants
CHRISWG-MEM Membership of CHRIS related WGs
CHRIS-MEM CHRIS Membership

2. **Approval of Agenda**
Docs: CHRIS17-2A Agenda

3. **Matters arising from Minutes of 16th CHRIS Meeting**
Docs: CHRIS17-3A Minutes of CHRIS-16
CHRIS17-3B Status / Review of Actions List from CHRIS-16
CHRIS17-3C Terms of Reference for CHRIS Committee and related Working Groups

4. **Decisions of other IHO bodies affecting CHRIS**
 - 4.1 WEND Committee
Docs: CHRIS17-4.1A Actions from the 9th WEND Committee Meeting
CHRIS17-4.1B ECDIS Type-Approval (SHOM)

 - 4.2 3rd Extraordinary International Hydrographic Conference (EIHC)
Docs: CHRIS17-4.2A Implementation of IHO Rules for the Accreditation of NGO's

 - 4.3 IHO Strategic Planning WG (SPWG)
Docs: CHRIS17-4.3A Establishment of the Hydrographic Services and Standards Committee (HSSC)

5. **Reports by CHRIS Working Groups**
 - 5.1 Transfer Standard Maintenance and Application Development (TSMAD)
Docs: CHRIS17-5.1A Report of TSMAD (M. Brown, USA-NOAA, Chair)
CHRIS17-5.1B The Next Edition of IHO S-57 (4.0), Version 1.1 - March 2005
CHRIS17-5.1C The ENC Product Specification Debate
CHRIS17-5.1D ENC Product Specification Options
CHRIS17-INF3 NHS Letter to IHB on S-57 Ed. 4.0

 - 5.2 Colour and Symbol Maintenance (C&SMWG)
Docs: CHRIS17-5.2A Report of C&SMWG (M. Jonas, Germany, Chair)

 - 5.3 Data Protection Scheme (DPSWG)
Docs: CHRIS17-5.3A Report of DPSWG (R. Sandvik, Norway-ECC, Chair)

 - 5.4 Standardization of Nautical Publications (SNPWG)
Docs: CHRIS17-5.4A Report of SNPWG (J. Melles, Germany, Chair)

 - 5.5 Chart Standardization and Paper Chart (CSPCWG)
Docs: CHRIS17-5.5A Report of CSPCWG (P. Jones, UK, Chair)
CHRIS17-5.5B Proposed Revised Terms of Reference for CSPCWG

6. **Work of CHRIS**
Docs: CHRIS17-6A Consolidated CHRIS Work Plan

- CHRIS17-6B *Guidelines for the Submission of Reports and Proposals for Consideration by CHRIS and CHRIS Subsidiary Bodies, Version 1.1 – January 2005*
- CHRIS17-6C *Guidelines for the Evaluation of Proposed New work Items for CHRIS and CHRIS subsidiary bodies, Version 1.1 – January 2005*
- CHRIS17-6D *Worked Example of the Use of the Templates (CHRIS Chair & Secretary)*
- 6.1 Re-structuring the S-52 Package
 Docs: CHRIS17-6.1A *Greece-IHO Submission to MSC 80 on amending the PS for ECDIS*
- 6.2 Printed ENCs
- 6.4 Print-on-Demand
 Docs: CHRIS17-6.3A *Print on Demand Nautical Charts Status in the U.S.A. (NOAA)*
- 7. Marine Information Objects (MIO)**
 Docs: CHRIS17-7A *Report of HGMIO (L. Alexander, USA-UNH, Chair)*
 CHRIS17-7B *Proposal for a New Work Item for HGMIO: Aids to Navigation Status (IHB)*
- 8. Open ECDIS Forum**
 Docs: CHRIS17-8A *Report on OEF Activities (L. Alexander, USA-UNH)*
- 9. Liaison with Industry**
 Docs: CHRIS17-9A *ECDIS Stakeholders' Forum - Programme*
- 10. Vector Data Development**
- 10.1 RENCs
 Docs: CHRIS17-10.1A *PRIMAR-Stavanger Status Report*
 CHRIS17-10.1B *IC-ENC Status Report*
 CHRIS17-10.1C *Virtual RENC in the Mediterranean and Black Sea Region – Status Report (Italy)*
- 10.2 ENC Development and Coverage
 Docs: CHRIS17-10.2A *ENC and IENC Production and Distribution Status in the USA (NOAA)*
 CHRIS17-10.2B *ENC Production and Distribution Status in Portugal*
 CHRIS17-10.2C *ENC Production and Distribution Status in France*
 CHRIS17-10.2D *National Report on Electronic Chart Production & Distribution in South Africa*
- 10.3 DNC Development
 Docs: CHRIS17-10.3A *Status Report on DNC Development (USA-NGA)*
- 10.4 Inland ECDIS
 Docs: CHRIS17-10.4A *Status Report on Inland ECDIS development and Standardization (L. Alexander, USA-UNH)*
- 11. Raster Data Development**
 Docs: CHRIS17-11A *RNC Production and Distribution Status in the USA (NOAA)*
- 12. Liaison with other Groups**
- 12.1 ISO-TC211 (Geographic Information-Geomatics)
 Docs: CHRIS17-12.1A *Report on TC211 Activities affecting CHRIS (IHB)*
 CHRIS17-INF4 *Draft IHO-ISO Memorandum of Understanding*

12.5 NATO-DGIWG (Digital Geographic Information W.G.)
Docs: CHRIS17-12.2A *Draft Cooperation Agreement Between the IHO and the DGIWG*

12.6 IEC-TC80-WG7 (ECDIS/ECS)
Docs: CHRIS17-12.3A *Status of the Standard IEC 62376 "Electronic chart systems (ECS) for small craft and non-SOLAS convention craft – Minimum operational and performance requirements, methods of testing and required test results" (July 2005) (USA-NOAA)*

12.7 IMO
Docs: CHRIS17-12.4A *Report on IMO Activities*

13. Any Other Business

13.1 Review of Information Papers
Docs: CHRIS17-INF1 *Status of IHO Publications on ECDIS (IHB)*
CHRIS17-INF2 *ENCs and Spatial Data Infrastructures (SDI) (IHB)*
CHRIS17-INF5 *Draft IHO-IEC Memorandum of Understanding*

13.2 Port Security Limits
Docs: CHRIS17-13.2A *Charting of Port Security Limits (IHB)*

14. Date and Location of Next Meeting

LIST OF ACTIONS FROM CHRIS17

AGENDA ITEM	SUBJECT	ACTION No.	ACTIONS (in bold, action by)
3.	ECDIS-related Terms	17/1	Secretary to forward all ECDIS-related terms and definitions, as contained in Annex I to minutes of CHRIS16 and in Annex F to these minutes, to the Chair of the IHO Committee on the Hydrographic Dictionary (S-32), in view of their inclusion in S-32.
4.1	QMS implementation	17/2	IHB to circulate Doc. WEND9-3C to IHO MS by CL.
4.2	CHRIS ToRs	17/3	IHB to circulate the revised CHRIS TORs to MS by CL for approval.
4.3	HSSC ToRs	17/4	CHRIS Chair to circulate all draft TORs (HSSC, DATS, SDPS and SSSP) to CHRIS Members for final review, then to submit them to the December 2005 SPWG Meeting.
5.1	Use of S-58	17/5/1	TSMAD Chair (Brown) to draft a letter to ECDIS manufacturers / users on the purpose and use of S-58, which will be forwarded by IHB.
	Currency of ECDIS Software	17/5/2	CHRIS Chair Group to investigate and pursue appropriate mechanisms to ensure an IMO requirement for the maintenance of the currency of ECDIS software.
	CL on ENC PS e3.1.1	17/5/3	CHRIS Chair Group to liaise with IHB to issue a Circular Letter informing MS and stakeholders of the development of ENC PS e3.1.1, with brief reasons and justification.
	Development of ENC PS e3.1.1	17/5/4	TSMAD to develop e3.1.1 of the ENC Product Specification, with target date of September 2006 (CHRIS18) for completion.
	CL on S-100 & S-101	17/5/5	CHRIS Chair Group to liaise with IHB to issue a Circular Letter informing MS and stakeholders of the impending changes related to S-100 and S-101.
	Development of S-100 & S-101	17/5/6	TSMAD to continue development work on S-100, and to commence work on S-101, with target dates of end 2007 and end 2012 for publication, respectively.
	Project Plan for S-100 & S-101	17/5/7	TSMAD to submit an impact statement and detailed project plan for the ongoing development of S-100 and S-101, for consideration at CHRIS18.

5.2	Linear Depth Areas	17/6/1	C&SMWG to reconsider the “linear depth areas” issue at its next meeting and C&SMWG Chair to prepare a paper on the matter, including proposed action, for submission to CHRIS18.
	New S-57 e3.1.1 objects	17/6/2	C&SMWG to draft symbolisation for S-57 e 3.1.1 added objects.
	PL Addendum	17/6/3	IHB to make the description of ECDIS symbols (PL Addendum) available free of charge on the IHO website.
	Pick Reports	17/6/4	Format for presentation of pick reports on ECDIS to be addressed by SNPWG .
	PL Maintenance	17/6/5	C&SMWG to continue low level maintenance of PL e3.3, including the necessary support for S-57 e3.1.1.
	Symbols Registry	17/6/6	C&SMWG to assess and monitor the move towards symbolization Registry System.
5.3	Criticisms on S-63	17/7	DPSWG Vice Chair (Smith) to convey the criticisms / concerns expressed by Industry at the ECDIS Stakeholders Forum, to the DPSWG Chair and all DPSWG members, for review and possible action.
5.4	NP3 Data Structure	17/8/1	SNPWG to develop NP3 data structure as an extension to S100, with target date of end 2007 for completion.
	NP3 Presentation	17/8/2	SNPWG to develop broad guidelines, parameters and principles for NP3 presentation in ECDIS, in execution of Task C of the SNPWG WP.
	NP3 Presentation	17/8/3	SNPWG Chair (Melles), in liaison with HGMIO Chair (Alexander), to seek assistance from academia and industry in developing appropriate standards and guidelines for NP3 presentation, through a suitable research project.
	Participation in SNPWG	17/8/4	CHRIS Members to encourage their representatives in SNPWG to participate and contribute more actively between meetings.
6.	CHRIS WP	17/9/1	CHRIS Chair and Secretary to review and streamline the CHRIS Work Plan format.
	CHRIS WP	17/9/2	CHRIS Chair to provide the current work plan to WG Chairs for review, prior to CHRIS18.
6.2	Printed ENC's	17/10	USA-NOAA to report progress on “Printed ENC's” to CHRIS18.
8.	OEF	17/11	IHB to reflect annual support of OEF in IHO budget.
9.	2 nd ECDIS Stakeholders	17/12	IHB to programme the next ECDIS Stakeholders Forum in conjunction with the 10 th WEND Committee Meeting.

	Forum		
10.4	Inland ECDIS	17/13	IEHG to be more actively involved in the development of S-100 and S-101. TSMAD Chair (Brown) to invite IEHG to participate in relevant TSMAD activities.
11.	Vector / Raster Data	17/14	CHRIS Secretary to ensure that, from CHRIS18 a single agenda item "Summary of Digital Data Availability" will replace the existing "Vector Data Development" and "Raster Data Development". "Inland ECDIS" will stand as a separate item.
12.1	ISO-IHO MoU	17/15	IHB to circulate the draft ISO-IHO MoU to Member States for comments / approval.
12.2	DGIWG-IHO CA	17/16	IHB to clarify the points raised at CHRIS18, then circulate the draft DGIWG-IHO CA to Member States for comments / approval.
12.3	ECS Standard	17/17	IHO MS to take note of the implications of the standard IEC 62376, related to regulating ECS.
12.4	Revision of the IMO PS for ECDIS	17/18	IHO MS to inform and support their own governments on the issue of revising the IMO Performance Standards for ECDIS.
13.1	IEC-IHO MoU	17/19/1	HGMIO Chair (Alexander) to provide the IHB with any comments on the draft IEC-IHO MoU, as contained in Doc. CHRIS17-INF5.
	IEC-IHO MoU	17/19/2	IHB to finalize the draft IEC-IHO MoU, then circulate it to Member States for comments / approval.

INTEGRATION OF THE ECDIS GLOSSARY INTO S-32

Remaining terms (11) not completed at CHRIS/16 (May 2004)

TERMS: The list of terms are from S -52 APP.3.

N/E: N = term from S -52 which is "new" to S-32, E = term from S -52 which already exists in S-32

PROPOSED DEFINITION = revised definition proposed for inclusion in S-32

COMMENTS = explanation as to the reasoning of the proposed action

TERM (from ECDIS Glossary)	N/E	PROPOSED DEFINITION	COMMENTS
CATZOC	N*		Not recommended for S-32; term is too specific. Add to acronym section of S-32.
cell	N	The basic unit of ENC DATA covering a defined geographical area bounded by two meridians and two parallels.	Derived from S -52.
colour tables	N		Not recommended for S-32. It is not really a definition.
Electronic Chart Data Base (ECDB)	N	The master data base for electronic navigational chart data, held in digital form by the national hydrographic authority.	Derived from S -52. Add ECDB to acronym section of S-32.
Electronic Chart Display and Information System (ECDIS)	E	A navigation information system which with adequate BACK-UP ARRANGEMENTS can be accepted as complying with SOLAS Chapter V requirements, 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	Derived from S -52 (Ref Performance Standards). Add ECDIS to acronym section of S-32.

Electronic Chart System (ECS)	N	Navigation information system that electronically displays vessel position and relevant nautical chart data and information from the ECS database on a display screen, but does not meet all IMO requirements for ECDIS, and does not satisfy SOLAS Chapter V requirement to carry a navigational chart.	Derived from ISO Standard for ECS chart. Add ECS to acronym section of S-32.
Electronic Navigational Chart Data (ENCD)	N*		Not recommended for S-32.
Electronic Navigational Chart Data Base (ENCDB)	N*		Not recommended for S-32.
ENC data	N*		Not recommended for S-32.
International Organization for Standards (ISO)	N*		Not recommended for S-32. Add to acronym section of S-32.
Raster Nautical Chart (RNC)		A facsimile of a paper chart originated by, or distributed on the authority of, a government-authorized hydrographic office. It is either a single chart or a collection of charts.	Derived from S-61. Add to acronym section of S-32.

Note:

* = denotes term is not recommended for inclusion in S-32.

THE USE OF ALL CAPITAL LETTERS = denotes that the word or term has its definition contained in S-32.

**TERMS OF REFERENCE FOR CHRIS COMMITTEE
and related Working Groups**

(as agreed by the 17th CHRIS Meeting, Rostock, Germany, 5-9 September 2005)

I. COMMITTEE ON HYDROGRAPHIC REQUIREMENTS FOR INFORMATION SYSTEMS (CHRIS)

Considering the need to promote and coordinate the development of standards, specifications and guidelines for official hydrographic products and services, to meet the requirements of mariners and other users of hydrographic information, the International Hydrographic Organization establishes a Committee on Hydrographic Requirements for Information Systems (CHRIS) with the following Terms of Reference and Rules of Procedure:

1. Terms of Reference

- 1.1 To monitor the requirements of mariners and other users of hydrographic information associated with development and use of paper hydrographic products and electronic information systems that may require data provided by national hydrographic authorities, and identify those technical matters that may affect the activities and products of those authorities.
- 1.2 To study and propose methods and minimum standards for the development and provision of official hydrographic data, nautical products and other related services.
- 1.3 To prepare and maintain publications to describe and promote the recommended methods, standards, specifications and guidelines as adopted by the International Hydrographic Organization, and advise Member States about implementation procedures.
- 1.4 To consider alternative procedures for the timely production of standards, for example by using external expertise when necessary.
- 1.5 To establish and maintain contact with other relevant IHO bodies, such as the Committee on WEND, the Legal Advisory Group, etc, to ensure that IHO activities are coordinated.
- 1.6 To liaise with other relevant international organizations

2. Rules of Procedure

- 2.1 The Committee is composed of Representatives of Member States and a representative of the International Hydrographic Bureau.
- 2.2 Accredited NGIO's may attend Committee Meetings.
- 2.3 Meetings shall be held at least once a year. The venue and date will be announced at least three months in advance.
- 2.4 Decisions should generally be made by consensus. If votes are required on issues or to endorse proposals presented to the Committee, only M/S may cast a vote. Votes shall be on the basis of one vote per M/S represented.
- 2.5 The length of tenure of the Chair and Vice-Chair is governed by IHO Technical Resolution T1.1.
- 2.6 The Committee will progress its work primarily through Working Groups, each of which will address specific tasks. Working Groups will operate by correspondence to the maximum extent practicable.

2.7 Recommendations of the Committee will be submitted to the IHO Member States for adoption through the Directing Committee.

II. TRANSFER STANDARD MAINTENANCE AND APPLICATIONS DEVELOPMENT W.G. (TSMAD)

1. Objective

- a) To maintain, develop and extend the IHO transfer standard for digital hydrographic data (currently Special Publication S-57), including development and maintenance of relevant application profiles;
- b) To monitor the development of other related international standards.

2. Authority

The Working Group is a subsidiary of CHRIS and its work is subject to CHRIS approval.

3. Procedures

- a) The WG should:
 - (i) maintain the IHO transfer standard for digital hydrographic data by preparing and promulgating maintenance documents containing clarifications, corrections and extensions when required;
 - (ii) review relevant international standards and specifications and advise CHRIS accordingly;
 - (iii) consider new topics as instructed by CHRIS and advise CHRIS accordingly and/or draft the relevant extension documents;
 - (iv) draft new editions of the IHO transfer standard for digital hydrographic data as instructed by CHRIS.
- b) The WG should work by correspondence, group meetings, workshops or symposia. Permanent or temporary sub-working groups may be created by the WG to undertake detailed work on specific topics such as: maintenance of the IHO transfer standard for digital hydrographic data, product specifications, tidal information, survey information, etc. The WG should meet at least once a year.
- c) The WG should liaise with other CHRIS WG's and other IHO and international bodies as appropriate and as instructed by CHRIS.

4. Composition and Chairmanship

- a) The WG shall comprise representatives of IHO Member States (M/S), Expert Contributors and Accredited NGIO Observers.
- c) Decisions should generally be made by consensus. If votes are required on issues or to endorse proposals presented to the WG, only M/S may cast a vote. Votes shall be on the basis of one vote per M/S represented.
- c) Expert Contributor membership is open to entities and organisations that can provide a relevant and constructive contribution to the work of the WG.
- d) The WG shall be chaired by a representative of a M/S. The length of tenure of the Chair and Vice-Chair is governed by IHO Technical Resolution T1.1.

- e) Expert Contributors shall seek approval of membership from the Chairman.
- f) Expert Contributor membership may be withdrawn in the event that a majority of the M/S represented in the WG agree that an Expert Contributor's continued participation is irrelevant or unconstructive to the work of the WG.
- g) All members shall inform the Chairman in advance of their intention to attend meetings of the WG.
- h) In the event that a large number of Expert Contributor members seek to attend a meeting, the Chairman may restrict attendance by inviting Expert Contributors to act through one or more collective representatives.

III. COLOURS AND SYMBOLS MAINTENANCE W.G. (C&SMWG)

1. Objective

To maintain IHO specifications for colours, symbols and display rules used to show SENC information on ECDIS in a safe and ergonomic manner.

2. Authority

This WG is a subsidiary of the Committee on Hydrographic Requirements for Information Systems (CHRIS). Its work is subject to CHRIS approval.

3. Procedures

- a) The WG should:
 - (i) Maintain Appendix 2 of IHO Special Publication S-52 and its accompanying Presentation Library, by preparing and promulgating maintenance documents when required.
 - (ii) Perform maintenance of Appendix 2 by immediate amendments for safety related matters and long-term revisions by deferred amendments.
 - (iii) Draft new editions of S-52 Appendix 2 as instructed by CHRIS.
 - (iv) Identify basic scientific fundamentals and provide guidance to ECDIS manufacturers related to colours and symbolization of hydrographic information.
 - (v) Provide and maintain a framework for display of SENC information that is feasible and practicable within available technology.
 - (vi) Coordinate technical exchange between C&SMWG, type-approval authorities, ECDIS manufacturers and ECDIS user community, including the conduction of comprehensive testing and validation of colours and symbolization by manufacturers, and at-sea trials with mariners.
 - (vii) Monitor the operational performance and development of IHO specifications, progress in display technology, and human perception analysis.
 - (viii) Consider new topics and other applications affecting electronic chart display, and/or draft the relevant extension documents.
- b) The WG should work by correspondence, group meetings, workshops or symposia. The WG should meet at least once every two years.

- c) The WG should liaise and harmonize with other ECDIS-related bodies as appropriate (e.g., TSMAD, CSPCWG, IEC, IMO/IHO HGE, IALA, WMO, IACS, NATO, etc.).
- d) The WG should identify a work programme for each year, including expected time frame.

4. Composition and Chairmanship

- a) The WG shall comprise representatives of IHO Member States (M/S), Expert Contributors and Accredited NGO Observers.
- b) Decisions should generally be made by consensus. If votes are required on issues or to endorse proposals presented to the WG, only M/S may cast a vote. Votes shall be on the basis of one vote per M/S represented.
- c) Expert Contributor membership is open to entities and organisations that can provide a relevant and constructive contribution to the work of the WG.
- d) The WG shall be chaired by a representative of a M/S. The length of tenure of the Chair and Vice-Chair is governed by IHO Technical Resolution T1.1.
- e) Expert Contributors shall seek approval of membership from the Chairman.
- f) Expert Contributor membership may be withdrawn in the event that a majority of the M/S represented in the WG agree that an Expert Contributor's continued participation is irrelevant or unconstructive to the work of the WG.
- g) All members shall inform the Chairman in advance of their intention to attend meetings of the WG.
- h) In the event that a large number of Expert Contributor members seek to attend a meeting, the Chairman may restrict attendance by inviting Expert Contributors to act through one or more collective representatives.

IV. DATA PROTECTION SCHEME W.G. (DPSWG)

1. Objective

To develop and maintain an IHO ENC data protection scheme.

2. Authority

This Working Group (WG) is a subsidiary of the IHO CHRIS. Its work is subject to IHO CHRIS approval.

3. Procedures

- a) The WG should:
 - (i) Enable immediate preparation of an IHO ENC Data Protection Scheme v.1 with documentation, software kernel and test data modelled on the Primar Security Scheme.
 - (ii) Review international developments in security services to amend and prepare IHO ENC Data Protection Scheme v.2 with industry representatives and other ECDIS standardisation bodies, and allow for a structured transition of the standard into the market.

- (iii) Develop procedures and information to enable IHO to assume responsibility of the documentation and supporting information and operate as the Security Scheme Administrator. Identify how technical support will be made available to IHO.
- b) The WG will liaise and harmonise with other international ECDIS-related bodies as appropriate;
- c) The WG should work by correspondence, and use group meetings, workshops or symposia only when required.
- d) The WG should identify a work programme for each year, including expected time frame.

4. Composition and Chairmanship

- a) The WG shall comprise representatives of IHO Member States (M/S), Expert Contributors and Accredited NGIO Observers.
- b) Decisions should generally be made by consensus. If votes are required on issues or to endorse proposals presented to the WG, only M/S may cast a vote. Votes shall be on the basis of one vote per M/S represented.
- c) Expert Contributor membership is open to entities and organisations that can provide a relevant and constructive contribution to the work of the WG.
- d) The WG shall be chaired by a representative of a M/S. The length of tenure of the Chair and Vice-Chair is governed by IHO Technical Resolution T1.1.
- e) Expert Contributors shall seek approval of membership from the Chairman.
- f) Expert Contributor membership may be withdrawn in the event that a majority of the M/S represented in the WG agree that an Expert Contributor's continued participation is irrelevant or unconstructive to the work of the WG.
- g) All members shall inform the Chairman in advance of their intention to attend meetings of the WG.
- h) In the event that a large number of Expert Contributor members seek to attend a meeting, the Chairman may restrict attendance by inviting Expert Contributors to act through one or more collective representatives.

V. STANDARDISATION OF NAUTICAL PUBLICATIONS W.G. (SNPWG)

1. Objective

To develop guidelines for the preparation of nautical publications, in a digital format compatible with ECDIS.

2. Definition

A Nautical Publication is a special-purpose book, or a specially compiled database, that is issued officially by or on the authority of a Government, authorized Hydrographic Office or other relevant government institution and is designed to meet the requirements of marine navigation. Nautical publications include but are not limited to:

*Distance Tables,
List of Buoys and Beacons,
List of Lights,
List of Radio Signals,
List of Symbols, Abbreviations and Terms used on Charts,*

*Mariners' Handbooks,
Notices to Mariners,
Routeing Guides,
Sailing Directions,
Tidal Stream Atlases,
Tide Tables.*

Nautical publications can be made available in a paper or a digital format.

3. Authority

This Working Group (WG) is a subsidiary of the Committee on Hydrographic Requirements for Information Systems (CHRIS) and its work is subject to CHRIS approval.

4. Procedures

- a) The WG should:
 - (i) Investigate the data format specifications, content and display requirements of digital nautical publications intended for use in ECDIS.
 - (ii) Draft guidance document(s) and/or revised technical resolutions, as appropriate.
 - (iii) Liaise with relevant IHO Technical WG's to ensure, technical feasibility and compatibility of any developed proposals.
- b) The WG should liaise with other CHRIS WG's and other IHO and international bodies as appropriate and as instructed by CHRIS.

5. Composition and Chairmanship

- a) The WG shall comprise representatives of IHO Member States (M/S), Expert Contributors and Accredited NGIO Observers.
- b) The WG should work primarily by correspondence. The WG should attempt to meet at least once every two years, normally in connection with another convenient IHO forum.
- c) Decisions should generally be made by consensus. If votes are required on issues or to endorse proposals presented to the WG, only M/S may cast a vote. Votes shall be on the basis of one vote per M/S represented.
- d) Expert Contributor membership is open to entities and organisations that can provide a relevant and constructive contribution to the work of the WG.
- e) The WG shall be chaired by a representative of a M/S. The length of tenure of the Chair and Vice-Chair is governed by IHO Technical Resolution T1.1.
- f) Expert Contributors shall seek approval of membership from the Chairman.
- g) Expert Contributor membership may be withdrawn in the event that a majority of the M/S represented in the WG agree that an Expert Contributor's continued participation is irrelevant or unconstructive to the work of the WG.
- h) All members shall inform the Chairman in advance of their intention to attend meetings of the WG.
- i) In the event that a large number of Expert Contributor members seek to attend a meeting, the Chairman may restrict attendance by inviting Expert Contributors to act through one or more collective representatives.

VI. DATA QUALITY W.G. (DQWG) [*currently dormant*]

1. Objective

To develop appropriate methods of classifying and depicting the quality of digital hydrographic information.

2. Authority

The Working Group (WG) is a subsidiary of CHRIS and its work is subject to CHRIS approval.

3. Procedures

- a) The WG should:
 - (i) monitor and develop the further use of quality indicators for hydrographic information;
 - (ii) propose methods for the depiction of quality indicators, such as Zones of Confidence (ZOC), on electronic displays;
 - (iii) develop guidance for the implementation of ZOC, covering the education of both the mariner and the cartographer, including the development of documentation and appropriate software;
 - (iv) propose relevant amendments and enhancements for incorporation in future editions of the IHO transfer standard for digital hydrographic data;
 - (v) provide to the relevant IHO Bodies information on the potential use of ZOC in non electronic media (for example, paper charts); and
 - (vi) propose new data quality topics and other applications for consideration by CHRIS.
- b) The WG should work primarily by correspondence. The WG should attempt to meet at least every two years, normally in connection with another convenient IHO forum.
- c) The WG should liaise with other CHRIS WG's and other IHO and international bodies as appropriate and as instructed by CHRIS.

4. Composition and Chairmanship

- a) The WG shall comprise representatives of IHO Member States (M/S), Expert Contributors and Accredited NGO Observers.
- b) Decisions should generally be made by consensus. If votes are required on issues or to endorse proposals presented to the WG, only M/S may cast a vote. Votes shall be on the basis of one vote per M/S represented.
- c) Expert Contributor membership is open to entities and organisations that can provide a relevant and constructive contribution to the work of the WG.
- d) The WG shall be chaired by a representative of a M/S. The length of tenure of the Chair and Vice-Chair is governed by IHO Technical Resolution T1.1.
- e) Expert Contributors shall seek approval of membership from the Chairman.

- f) Expert Contributor membership may be withdrawn in the event that a majority of the M/S represented in the WG agree that an Expert Contributor's continued participation is irrelevant or unconstructive to the work of the WG.
- g) All members shall inform the Chairman in advance of their intention to attend meetings of the WG.
- h) In the event that a large number of Expert Contributor members seek to attend a meeting, the Chairman may restrict attendance by inviting Expert Contributors to act through one or more collective representatives.

VII. CHART STANDARDIZATION AND PAPER CHART W.G. (CSPCWG)

1. Objectives

- a) To provide a core of expertise on the basic concepts of charting, noting that whatever physical form the chart may take the fundamental concepts and elements of marine cartography remain the same.
- b) To develop and maintain the IHO publications for which it is responsible.

2. Authority

The Working Group (WG) is a subsidiary of CHRIS and its work is subject to CHRIS approval. In the interests of procedural efficiency the WG has authority to reach decisions on the maintenance and updating of the documents for which it is responsible and seek direct endorsement of its proposals by IHO Member States via the IHB. This does not include matters that may have a strategic or financial implication for Member States or other interested stakeholders.

3. Procedures

- a) The WG's main tasks are to:
 - i. Keep under continuous review the IHO publication M-4 'Regulations of the IHO for International (INT) Charts and Chart Specifications of the IHO', in order to advise the IHO on their updating, design and format. Note: M-4 incorporates:
 - INT 1 'Symbols, Abbreviations and Terms used on Charts'
 - INT 2 'Borders, Graduation, Grids and Linear Scales'
 - INT 3 'Use of Symbols and Abbreviations, as recommended by the IHO'
 - ii. Advise the IHO on suggestions put forward by Member States to update M-4, in accordance with IHO Specification B-160, with the goal of achieving the maximum possible adherence by Member States to the Regulations and Specifications.
 - iii. Keep under continuous review the IHO publication M-11 Part A 'Guidance for the Preparation and Maintenance of International Chart Schemes' in order to advise the IHO on its updating.
 - iv. Advise the IHB and Regional Hydrographic Commissions, as appropriate, on the work of Regional Charting Groups (RCG) in order to promote the production of large- and medium-scale international (INT) charts. The role of the WG is purely consultative.
 - v. Offer advice based on its experience to RCG and individual Member States, on chart schemes and cartographic work, in order to encourage adherence to IHO charting standards. The role of the WG is purely consultative.
- b) The WG conducts its business mainly by correspondence. It will also plan to hold meetings at least once every two years, dependant on membership support and business needs.

- c) All members shall inform the Chairman in advance of their intention to attend meetings of the WG.
- d) Decisions should generally be made by consensus. If votes are required on issues or to endorse proposals presented to the WG, votes shall be on the basis of one vote per Member State represented.
- e) The WG should identify a work programme for each year, including expected time frame for progressing tasks.
- f) The WG will maintain close liaison with other CHRIS WGs, particularly C&SMWG, and other international and IHO bodies, as appropriate and as instructed by CHRIS.
- g) The WG will report progress to meetings of CHRIS and to Member States through the CHRIS report in the Annual Report of the IHB

4. Composition and Chairmanship

- a) Membership of the CSPCWG is open to all Member States wishing to be represented. Normally there should be not more than one representative from each Member State.
- b) Accredited Non-Governmental International Organizations observers may participate in CSPCWG activities.
- c) A Chairman and Vice-Chairman will be appointed by election from participant Member States of the WG.
- d) Length of tenure of Chairmanship and Vice-Chairmanship is governed by IHO Technical Resolution T1.1.
- e) The Chairman and Vice-Chairman will decide between themselves the organization of the work entailed in these posts.
- f) The Chairman will monitor membership to ensure that each regional hydrographic commission is invited to be represented on the WG.
- g) A Secretary will be appointed, normally from within the organization of the Chairman of the WG, to ensure the smooth running of business, and to administer consultation and collation of members' views. The Secretary is a member of the WG.

5. Guiding principles

- a) M-4 PartB provides an internationally-agreed product specification for both national and international (INT) charts at medium- and large-scale. The role of M4 Part B is twofold, in that it provides:
 - i. an explanation of the general concepts and rationale behind the portrayal of features on charts, much of which is relevant to both digital and paper charts.
 - ii. specific guidance for paper charts, including the use of text and symbology.

VIII. IHO-IEC HARMONIZING GROUP ON MARINE INFORMATION OBJECTS (HGMIO)

1. Objective

To harmonise the activities of the International Electrotechnical Commission (IEC) and International Hydrographic Organisation (IHO) related to Marine Information Objects (MIOs).

Definition:

MIOs consist of supplementary information to be used with an Electronic Chart Display and Information System (ECDIS) that currently, are not Electronic Navigational Chart (ENC) objects or specified navigational elements or parameters. Supplementary means non-mandatory information that is in addition to those required by existing ECDIS-related standards and specifications. MIOs may be either chart- or navigation-related. Some examples of MIOs

include: Ice Information; Tides/Water Levels and Current Flow; Oceanographic, Meteorological; Marine Habitats; and Environmental Protection.

2. Authority

2.1 The IMO Performance Standards for ECDIS specify for:

a) Chart-related information:

- (i) the Electronic Navigational Chart (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*” (Section 2.2).
- (ii) *The chart information to be used in ECDIS conforms to IHO transfer standard for digital hydrographic data (currently, S-57) (Section 4.1).*
- (iii) *IHO recommended colours and symbols (S-52) should be used to represent System ENC information (Section 8.1).*

b) Navigation-related information:

- (i) *Radar information or other navigational information may be added to the ECDIS display. However, it should not degrade the SENC information, and should be clearly distinguishable from the SENC information (Section 6.1).*
- (ii) *The colours and symbols other than those mentioned in 8.1 should be used to describe the navigational elements and parameters listed in Appendix 3 and published by IEC Publication 61174 (Section 8.2)*

2.2 HGMIO is a subsidiary of two committees:

- (i) IHO Committee on Hydrographic Requirements for Information Systems (CHRIS).
- (ii) IEC Technical Committee No. 80- Maritime Navigation and Radiocommunications Equipment and Systems (TC80)

3. Procedures

The HGMIO should:

- a) Harmonize the activities of IHO and IEC related to the provision and display of supplemental chart- and navigation-related information on ECDIS.
- b) Conduct technical exchange on MIOs with type-approval authorities, ECDIS manufacturers and ECDIS user community.
- c) HGMIO maintains a functional working relationship with:
 - (i) IHO CHRIS/Transfer Standard Maintenance and Applications Development WG (TSMAD)
 - (ii) IHO CHRIS/Colours and Symbols Maintenance WG (C&SMWG)
 - (iii) IEC TC80/Working Group 7 (ECDIS)
 - (iv) IEC TC80/Working Group 13 (Navigation Display)
- d) Liaise with other organizations, committees and working groups involved in ECDIS-related matters. This may include:

IMO/IHO Harmonization Group on ECDIS (HGE)
International Association of Lighthouse Authorities (IALA)
World Meteorological Organization (WMO)
North Atlantic Treaty Organization (NATO)
IHO Tidal Committee

- e) When instructed by IHO CHRIS, recommend appropriate changes or additions to:
 - 1) IHO transfer standard for digital hydrographic data (currently, S-57)
 - 2) IHO S-52, Appendix 2
- f) When instructed by IEC TC80, recommend new navigation-related symbols to be incorporated into:
 - IEC 61174, Annex E (Navigational Symbols for ECDIS)
 - IEC 62288 (Presentation of Navigation-related Information)

4. Composition and chairmanship

- a) HGMIO should be comprised of members or participants of standing IHO and IEC committees or working groups. The Chairman may also invite subject matter experts to participate as required.
- b) HGMIO should be chaired by an individual who is an active participant in both IHO CHRIS and IEC TC80.

5. Guiding Principles

Overall, the role of HGMIO is to facilitate the development and implementation of Marine information Objects. To this end there are a number of guiding principles:

- a) The primary focus of developing specifications related to the use Marine Information Objects (MIOs) on ECDIS should be to supplement the minimum chart- and navigation-related information required for safety of navigation.
- b) The HGMIO should monitor other ECDIS-related developments and performance standards that may involve the display of additional navigation-related information. This would include IMO Performance Standards for other navigation systems, such as Automatic Identification Systems (AIS), VTS-related information proposed by IALA, and Displays for the Presentation of Navigation-Related Information by IEC.
- c) The HGMIO should monitor what is occurring related to ECDIS type-approval. This should include such matters as current exceptions granted and future regulations (e.g., carriage requirements).
- d) Recommendations for MIOs should not be finalized without first conducting comprehensive testing and evaluation, validation by ECDIS manufacturers, and at-sea trials with mariners.

**DRAFT TERMS OF REFERENCE FOR HSSC COMMITTEE
and related Sub-Committees**

(as agreed by the 17th CHRIS Meeting, Rostock, Germany, 5-9 September 2005)

I HYDROGRAPHIC SERVICES AND STANDARDS COMMITTEE (HSSC)

Considering the need to promote and coordinate the development of official products, and services and their delivery system to meet the requirements of mariners and other users of hydrographic information, the International Hydrographic Organization establishes a Hydrographic Services and Standards Committee (HSSC) with the following Terms of Reference and Rules of Procedure:

1. Terms of Reference

- 1.1 To monitor the requirements of mariners and other users of hydrographic information associated with development and use of paper hydrographic products and electronic information systems that may require data provided by national hydrographic offices, and identify the matters that may affect the activities and products of these offices.
- 1.2 To study and propose methods and minimum standards for the development and provision of official hydrographic data, nautical products and other related services.
- 1.3 To prepare and maintain publications to describe and promote the Committee's recommended methods and standards adopted by the International Hydrographic Organization, and advise national hydrographic offices about implementation procedures as required by those offices.
- 1.4 To consider alternative procedures for the timely production of standards, for example using external expertise when necessary.
- 1.5 To establish and maintain contact with other relevant IHO bodies, such as the Inter-Regional Coordination Committee (IRCC), the Legal Advisory Group, etc...
- 1.6 To liaise with other relevant international organizations

2. Rules of Procedure

- 2.1 The Committee is composed of Representatives of Member States and a representative of the International Hydrographic Bureau.
- 2.2 Accredited NGIO's may attend Committee Meetings.
- 2.3 Meetings shall be held at least once a year. The venue and date will be announced at least three months in advance.
- 2.4 Decisions should generally be made by consensus. If votes are required on issues or to endorse proposals presented to the Committee, only M/S may cast a vote. Votes shall be on the basis of one vote per M/S represented.
- 2.5 The length of tenure of the Chair and Vice-Chair is governed by IHO Technical Resolution T1.1
- 2.6 The Committee will progress its work primarily through three sub-committees (i.e. Symbology & Data Presentation Standards Sub-Committee, Data Acquisition & Transfer Standards Sub-Committee and Supporting Services & Special Projects Sub-Committee) and their Working Groups, each of which will address specific tasks. Sub-Committees will operate by correspondence to the maximum extent practicable.

- 2.7 Recommendations of the Committee will be submitted to the IHO Member States for adoption through the Directing Committee. (to be replaced by Assembly or Council).

II. SUB-COMMITTEE ON DATA ACQUISITION AND TRANSFER STANDARDS (DATS)

Purpose:

Provide support and recommendations to HSSC related to the development and use of standards on hydrographic data acquisition and transfer.

1. Terms of Reference

- 1.1 Monitor and coordinate the work of its subordinate working groups that address data acquisition and transfer standards. A list of the current working groups is contained in Annex A.
- 1.2 Establish working groups to address new work items as directed by HSSC.
- 1.3 Develop and maintain the IHO publications for which it is responsible.
- 1.4 Liaise with the other HSSC Sub Committees to ensure that work activities are coordinated.
- 1.5 Establish and maintain contact with other relevant IHO bodies, such as the Inter-Regional Coordination Committee (IRCC), the Legal Advisory Group, etc...
- 1.6 Liaise with other relevant international organizations, as appropriate.

2. Rules of Procedures

- 2.1 The Sub Committee is composed of the Chairs of the subordinate Working Groups, representatives of Member States and a representative of the International Hydrographic Bureau.
- 2.2 Accredited NGO's may attend Sub-committee Meetings.
- 2.3 Meetings shall be held at least once a year. The venue and date will be announced at least three months in advance.
- 2.4 Decisions should generally be made by consensus. If votes are required on issues or to endorse proposals presented to the Sub-Committee, only M/S may cast a vote. Votes shall be on the basis of one vote per M/S represented.
- 2.5 The Sub-Committee shall be chaired by a representative of a Member State. The Chairman and the Vice-Chairman shall be chosen by the Member States represented in the Sub-Committee. The length of tenure of the Chair and Vice-Chair is governed by IHO Technical Resolution T1.1.
- 2.6 The Sub Committee will primarily operate by correspondence to the maximum extent practicable and will progress its work through Working Groups, each of which will address specific tasks. This will be achieved by:
- (i) monitoring the work of its subordinate working groups;
 - (ii) coordinating the work of its subordinate working groups;
 - (iii) evaluating the continuing validity of working group assignments and task lists.
- 2.7 The Sub-Committee should identify a work programme for each year, including expected time frame for progressing tasks.
- 2.8 Recommendations of the Sub-committee will be submitted to the HSSC.

III. SUB-COMMITTEE ON SYMBOLOGY AND DATA PRESENTATION STANDARDS (SDPS)

Purpose:

Provide support and recommendations to HSSC related to the development of standards for hydrographic data portrayal.

1. Terms of Reference

- 1.1 Provide a core of expertise in the basic concept on the presentation of marine geospatial information.
- 1.2 Monitor the progress in presentation technology and human perception analysis. Identify basic scientific fundamentals related to colours and symbolization.
- 1.3 Originate and maintain IHO specifications and standards for symbology and data presentation, which include S52, M-4, M-11 and M-12, taking into account the full range of products independent of media and format.
- 1.4 Liaise with the other HSSC Sub Committees to ensure that work activities are coordinated.
- 1.5 Coordinate technical exchange with other stakeholders, such as type-approval authorities, navigation equipment manufacturers, and the user community.
- 1.6 Establish and maintain contact with other relevant IHO bodies, such as the Inter-Regional Coordination Committee (IRCC), the Legal Advisory Group, etc...
- 1.7 Liaise with other relevant international organizations, as appropriate.

2. Rules of Procedures

- 2.1 This sub-committee is a subsidiary of the Hydrographic Services and Standards Committee (HSSC) and its work plans are subject to HSSC approval.
- 2.2 The Sub-committee is composed of representatives of Member States and a representative of the International Hydrographic Bureau.
- 2.3 Accredited NGO's may attend Sub-committee Meetings.
- 2.4 Meetings shall be held at least once a year. The venue and date will be announced at least three months in advance.
- 2.5 Decisions should generally be made by consensus. If votes are required on issues or to endorse proposals presented to the Sub-Committee, only M/S may cast a vote. Votes shall be on the basis of one vote per M/S represented.
- 2.6 The Sub-Committee shall be chaired by a representative of a Member State. The Chairman and the Vice-Chairman shall be chosen by the Member States represented in the Sub-Committee. The length of tenure of the Chair and Vice-Chair is governed by IHO Technical Resolution T1.1.
- 2.7 The Sub-Committee will progress its work primarily through working groups, and will primarily operate by correspondence to the maximum extent practicable.
- 2.8 The Sub-Committee should identify a work programme for each year, including expected time frame for progressing tasks.
- 2.9 Recommendations of the Sub-committee will be submitted to the HSSC.

IV. SUB-COMMITTEE ON SUPPORTING SERVICES AND SPECIAL PROJECTS (SSSP)

Purpose:

Provide support and recommendations to HSSC related to the development and provision of supporting services to IHOMS.

1. Terms of Reference

- 1.1. Monitor the requirements of member states and other stakeholders related to hydrographic products and services, and identify those matters that may affect their activities.
- 1.2. Evaluate and recommend improved methods and procedures to provide official hydrographic data, nautical products and supporting services.
- 1.3. Prepare and maintain publications to describe and promote the Committee's recommended methods and standards adopted by the International Hydrographic Organization
- 1.4. Advise national hydrographic offices about implementation procedures as required by those offices.
- 1.5. Liaise with the other HSSC Sub Committees to ensure that work activities are coordinated.
- 1.6. Establish and maintain contact with other relevant IHO bodies, such as the Inter-Regional Coordination Committee (IRCC), the Legal Advisory Group, etc...
- 1.7. Liaise with other relevant international organizations, as appropriate.
- 1.8. When directed, undertake special projects related to technical support services.

2. Rules of Procedure

- 2.1 This sub-committee is a subsidiary of the Hydrographic Services and Standards Committee (HSSC) and its work plans are subject to HSSC approval.
- 2.2 The Sub-committee is composed of representatives of Member States and a representative of the International Hydrographic Bureau.
- 2.3 Accredited NGIO's may attend Sub-committee Meetings.
- 2.4 Meetings shall be held at least once a year. The venue and date will be announced at least three months in advance.
- 2.5 Decisions should generally be made by consensus. If votes are required on issues or to endorse proposals presented to the Sub-Committee, only Member States may cast a vote. Votes shall be on the basis of one vote per Member State represented.
- 2.6 The Sub-Committee shall be chaired by a representative of a Member State. The Chairman and the Vice-Chairman shall be chosen by the Member States represented in the Sub-Committee. The length of tenure of the Chair and Vice-Chair is governed by IHO Technical Resolution T1.1.
- 2.7 The Sub-Committee will progress its work primarily through working groups, and will primarily operate by correspondence to the maximum extent practicable.
- 2.8 The Sub-Committee should identify a work programme for each year, including expected time frame for progressing tasks.
- 2.9 Recommendations of the Sub-committee will be submitted to the HSSC.

CHRIS WORK PLAN
Version 1.5 - September 2005

(as agreed by the 17th CHRIS Meeting, Rostock, Germany, 5-9 September 2005)

Objective:

To ensure efficient project resource management and alignment, progress monitoring and to provide a communication utility with internal and external parties.

Rationale:

The justification for the CHRIS Workplan are in conformance with the IHO Strategic Plan, and mainly related to the following elements of the IHO Work Programme – 2003/07:

- 3.1. Nautical Cartography
- 3.4. Data for Geomatic Applications

Revisions:

Chairs of each Working Group, along with the CHRIS Chair, will meet prior to each CHRIS meeting to review progress, and to harmonize the Workplan.

Approval:

Once revised, the workplan will be approved by the CHRIS plenary at each annual meeting. CHRIS Chair could seek committee members interim approval for emerging issues between meetings.

Communications:

The CHRIS Workplan will be posted on the IHO website, and a progress summary will be provided at IHO Conferences.

Project Numbering:

Each task will be given a sequential number independent of related Working Group. The related IHO Work Programme Element number and the specific CHRIS meeting that approved the inclusion of the task will be identified in the CHRIS Work Plan summary. Each WG SubTasks will be numbered using an alphanumeric sequence, "An,Bn,Cn.."

Priorities:

Three Levels of Priorities (H, M, and L) will be assigned by CHRIS using the Guidelines on the Evaluation of Proposals in the Work of CHRIS and Subsidiary Bodies.

1. Guidelines for the Evaluation of Proposed New work Items for CHRIS and CHRIS subsidiary bodies (Version 1.1 – January 2005)

Introduction

1.1 In order to best use the limited resources available to CHRIS and its subsidiary bodies it is necessary for the CHRIS to evaluate and prioritise proposed new work items. These guidelines are based on the principles agreed at CHRIS/15 and are intended to provide a uniform basis for this evaluation and prioritisation.

1.2 Evaluation should be done as a two-stage process:

- .1 general consideration leading to acceptance or rejection; and if accepted,
- 2 establishment of priorities.

General acceptance

1.3 Before deciding to include a new item in the work programme of CHRIS or its subsidiary bodies, the following factors should be taken into account:

- .1 is the subject addressed by a proposal considered to be within:
 - .1 the scope of IHO objectives?
 - .2 the current IHO work programme?
- .2 has a need for the measure proposed been identified (e.g., client demand, internal improvements)?
- .3 do adequate industry standards or solutions exist or are they being developed thereby reducing the need for action through CHRIS?
- .4 is the objective achievable in the existing CHRIS work program?

Establishment of priorities

1.4 Priorities for accepted work items should normally be assigned based on consideration of the following factors:

- .1 measures aimed at substantially preventing maritime casualties or marine pollution incidents;
- .2 measures to overcome identified deficiencies in existing IHO standards and technical resolutions;
- .3 measures needed to align IHO standards and resolutions with those of other relevant international standards and recommendations;
- .4 measures required to take into account the introduction of new technologies and methods in maritime transportation;
- .5 measures required to take into account new measuring, surveying and production techniques in hydrography;
- .6 measures leading to increased Hydrographic Office efficiency.

1.5 Follow up actions in response to specific requests emanating from the International Hydrographic Conference or other international and intergovernmental organisations should be evaluated in light of paragraph 4 above unless specifically identified as urgent matters.

General remarks

1.6 When setting priorities, a certain flexibility should be provided to allow for initiatives that could not be foreseen.

1.7 Once a decision has been made on the basis of the above for a new work item to be included in the work programme of CHRIS or a CHRIS subsidiary body, an appropriate target completion date should be established, taking into account the urgency of the matter concerned.

1.8 In general, proposals for new work items as well as the revised work programs raised by WG Chairs as part of their annual reports should include a proposed priority for each work item, based on the guidelines above.

1.9 Wherever possible, proposed priorities for work items will be considered ahead of a CHRIS meeting by a "CHRIS Chair Group" comprising Chairman, Vice chairman, Secretary and all available WG Chairs. Final endorsement of work item priorities will rest with the CHRIS and be considered at the CHRIS meeting.

2. CHRIS relevant elements of IHO Work Programme 2003-2007

2.1 IHO Programme 3. Element 3.1 Nautical Cartography

O 3. 1. 1 Continuation of the co-operative work on development of ECDIS services, particularly:

3.1.1.1 On-going refinement and expansion of specifications and standards through the CHRIS and its working groups, with links to the CSPCWG, IEC and ISO . **[HP]**

3.1.1.2 Participation in the regulatory, testing and certification aspects of ECDIS through the IMO/IHO HGE and IEC/TC80 in matters concerning ECDIS, RCDS, and ECS. **[HP]**

3.1.1.3 Develop contacts with the international bodies representing private industry [umbrella organizations], to reduce potential conflicts and to maximize quality and availability of adequate digital nautical products, by inviting their participation in appropriate IHO forums, and through IHO participation in non-government activities such as Open ECDIS Forum [OEF]. **[HP]**

O 3. 1. 2 Participation in the development of standards for cartography and geographic information in association with groups such as DGIWG, ICA, IEC and ISO, in order to ensure that the interests of IHO members receive attention in the formulation of standards. **[HP]**

O 3. 1. 3 Development of the international [paper] chart series through the relevant committees and bodies. **[MP]**

3.1.3.1 Development of new symbology for ship routing, including archipelagic sea lanes, vessel traffic services, environmentally sensitive areas, etc. **[MP]**

3.1.3.2 Progress of the work of the Committee on the Standardization of Nautical Publications, (i.e. Sailing Directions and other nautical publications) and monitor the development of standard formats for Notices to Mariners. **[MP]**

3.1.3.3 Resolution of issues concerning the extension of the INT chart scheme to include large scale charts. **[MP]**

Tasks

T 3. 1. 1 Revise, develop, and maintain the following publications:
S-52, S-57 New Editions **[by 2006]**, M-4, M-11, **[by 2003]**

2.2 IHO Programme 3. Element 3.4 Data for Geomatics Application

O 3. 4. 1 Assist Member States to optimize and extend the use of their hydrographic data sets for purposes other than navigation through:

3.4.1.1 Development of generic product and service specifications. Investigate, through the Subgroup of TSMAD for Hydro Survey Data and Exchange, how to include these data as a part of S-57. **[HP]**.

Tasks

T 3. 4. 2 Complete harmonization of IHO spatial data standards with ISO standards. **[by 2006]**

CHRIS Workplan - Summary Table

CHRIS WG	Task	IHO W.P.	CHRIS Meeting	Projects	Priority*	Start Date	End Date	Remarks
TSMAD	A	T3.4.2	17	Develop S-100 based on ISO TC211 geo-spatial standards.	H	2001	2007	No product specifications shall be developed unless specifically directed
TSMAD	B	O3.1.1	14	Keep S-58 Recommended ENC validation checks up to date	H	2002	Cont	
TSMAD	C	O3.1.1	14	Support FAQ and encoding advice sections of IHO web site up to date	H	2002	Cont	
TSMAD	D	T3.4.2	17	Develop S-57 Ed. 3.1.1 and revise ENC Product Specification	H	2005	2006	
C&SMWG	A	T3.1.1	14	Develop S-52 App. 2 "Colours and Symbols Specifications for ECDIS", Edition 4.2 and its Annex A "Presentation Library", Edition 3.3	H		2004	
C&SMWG	B	O3.1.1	14	Contribute to IEC TC80/WG13 symbol harmonizing work	H		2004	
C&SMWG	C	T3.1.1	14	Examination of S-52 main documents and annexes for redundant operational aspects of ECDIS	M		2004	
C&SMWG	D	O3.1.1	14	Introduce new website based recommendation service for good application practice of S-52	M		na	
C&SMWG	E	O3.1.1	14	Contribute to harmonised rules for ENC loading strategy, use of SCAMIN and overscale indication	M		2004	
C&SMWG	F	T3.1.1	14	Assess the impact on S-52 C&S regulations of other IHO standards	M		2004	
DPSWG	A	O3.1.1		Complete IHO S-63 Data Protection Scheme documentation	H	2003	2004	
DPSWG	B	O3.1.1		Publish IHO S-63 and provide support	H	2003	2006	
DPSWG	C	O3.1.1		Monitor and support industry transition from Primar Security Scheme to IHO S-63	H	2003	2006	
CSPCWG	A	T3.1.1	14	Revise M-4	M	2001	2007	Being revised by Sections
CSPCWG	B	T3.1.1	14	Revise M-11			2005	Integrate S-48. IHB to incorporate in M-11. IHO CL 37/2005 refers.
CSPCWG	C	O3.1.3.2	15	Review requirement for standardization of International Notices to Mariners			2004	Requirement reviewed. Include within item A
CSPCWG	D	O3.1.3.1	15	Development of new symbology (including depiction of Fairways, AIS-equipped AtoN)	M	2004	2006	Fairway submission to CSPCWG 2

* H = High, M = Medium, L = Low

CHRIS WG	Task	IHO W.P.	CHRIS Meeting	Projects	Priority *	Start Date	End Date	Remarks
CSPCWG	E	O3.1.1	14	Revise supplementary documents to M-4 (INT 1, 2, 3)	M	2003	2006	New edition of INT 1 published in 2005
SNPWG	A	O3.1.1	15	Decide on the Data Format of digital NPs intended for use in ECDIS.	H			
SNPWG	B	O3.1.1	15	Define the content requirements of digital NPs intended for use in ECDIS.	M			
SNPWG	C	O3.1.1	15	Develop display rules for digital NPs intended for use in ECDIS.	M			
SNPWG	D	O3.1.1	15	Draft guidance documents and revised technical resolutions.	M			
SNPWG	E	O3.1.1	15	Liaise with other CHRIS WG's and other IHO and international bodies.	M			
HGMIO	A	O3.1.1	15	For each MIO category, describe the current status of development efforts (e.g., data or display-related)	M			
HGMIO	B	O3.1.1	15	For each MIO category, assess level of completion and further development required	L			
HGMIO	C	O3.1.1	15	Recommend to TSMAD and C&SMWG MIO-related matters that warrant consideration for inclusion in next editions of S-57 and S-52	L			

3. TSMAD Work Plan

[Any remarks relevant to the understanding of the plan to be inserted here]

3.1 TSMAD Tasks

- A Develop S-100 based on ISO TC211 geo-spatial standards (IHO T3.4.2 refers)
- B Keep S-58 Recommended ENC validation checks up to date (IHO O3.1.1 refers)
- C Support FAQ and encoding advice sections of IHO web site up to date (IHO O3.1.1 refers)
- D Develop S-57 Ed. 3.1.1 and revise ENC Product Specification

Task	Work item	Priority *	Milestones	Start Date	End Date	Status **	Contact Person(s)	Affected Pubs/Standard	Remarks
A.1	Develop S-100 Object Catalogue.	H		2001	Feb 06	O	Holger Bothien bo@sevens.com		
A.2	Develop S-57 Edition 4.0 ENC product specification	L		2001	Jun.06	O	Chris Roberts Chris.Roberts@defence.gov.au		
A.3	Develop S57 Edition 4.0 Imagery and Gridded data models.	H		2001	Feb.06	O	Don Vachon VachonDon@dfo.mpo.gc.ca		
A.4	Develop S-57 Edition 4.0 Time varying and 3-D data.	H		2001	Oct.04	O	Jim Radice JRadice@navcen.uscg.mil		
A.5	Develop S-57 Edition 4.0 Expansion of meta data contents.	H		2001	Jul.06	O	Tony Pharaoh apharaoh@ihb.mc		
A.6	Review of S-57 base documents.	H		2001	Feb.06	O	Barrie Greenslade Barrie.Greenslade@ukho.gov.uk		
A.7	Develop S-57 Edition 4.0 Bathymetric Content Specification.	H		2001		O	Lee Alexander Lee.Alexander@unh.edu		
A.8	Develop S-57 Edition 4.0 Portrayals (Data Depiction).	H		2001		P	Tony Pharaoh apharaoh@ihb.mc		Not Activated
A.9	Develop S-57 to paper chart functionality and Print-on-Demand (POD) file transfer guidelines.	M		2003		P	Cameron McLeay cameron.mcleay@caris.com		Not Activated
A.10	Liaise with Non-IHO Constituents, e.g. Inland ECDIS, Marine Navigation Industry, DGIWG, AML, WMO Ice, and GIS Industry.	H		2004	-	O	Lee Alexander lee.Alexander@unh.edu		

* H = High, M = Medium, L = Low

** P = Planned, O = Ongoing, C = Completed

Task	Work item	Priority *	Milestones	Start Date	End Date	Status **	Contact Person(s)	Affected Pubs/Standard	Remarks
B.1	Keep S-58 Recommended Validation Checks up to date	H		2003	-	O	Guy Uguen Guy.uguen@shom.fr		
C.1	Support FAQ and Encoding Bulletins	H		2003	-	O	Jeff Wooton jeff.wooton@defence.gov.au		
D	Develop S-57 Ed. 3.1.1 and revise ENC Product Specification	H		2005	2006	O			

TSMAD

Date	Location	Activity
29 Sep – 3 Oct 03	Wollongong, Australia	10th Meeting
11-12 November 04	IHB, Monaco	11 th Meeting
10-11 November 05	Wollongong, Australia	12 th Meeting

TSMAD Sub-WG

Date	Location	Activity
25-29 April 05	Univ. of NH, USA	8th Meeting
7-9 November 05	Wollongong, Australia	9 th Meeting

4. C&SMWG Work Plan

[Any remarks relevant to the understanding of the plan to be inserted here]

4.1 C&SMWG Tasks

- A Develop S-52 App. 2 “Colours and Symbols Specifications for ECDIS”, Edition 4.2 and its Annex A “Presentation Library”, Edition 3.3 (IHO T3.1.1 refers).
- B Contribute to IEC TC80/WG13 symbol harmonizing work (IHO O3.1.1 refers).

- C Examination of S-52 main documents and annexes for redundant operational aspects of ECDIS (IHO T3.1.1 refers).
- D Introduce new website based recommendation service for good application practice of S-52 (IHO O3.1.1 refers).
- E Contribute to harmonised rules for ENC loading strategy, use of SCAMIN and overscale indication (IHO O3.1.1 refers).
- F Assess the impact on S-52 C&S regulations of other IHO standards (IHO T3.1.1 refers).
- G Improving ENC Consistency/loading strategies
- H Harmonisation of pick report presentation
- I Develop Symbols for object and attribute enhancements of S-57 Edition 3.1.1
- J Harmonisation with SPCWG
- K Built a CSMWG bulletin and FAQ section on the IHO website

Task	Work item	Priority *	Milestones	Start Date	End Date	Status **	Contact Person(s)	Affected Pubs/Standard	Remarks
F.2	Consideration of the implications of future S100/S101 on S-52 C&S regulations	M		2003		O	Mathias Jonas Sven Herberg	S-52, App.2 S-57, Vers. 4.0	
F.3	Identify methods to incorporate symbolization into the S100 registry	M		2005		P	Mathias Jonas Pol Lebihan Sven Herberg	S-52, App. 2 S100	

* H = High, M = Medium, L = Low
 ** P = Planned, O = Ongoing, C = Completed

Task	Work item	Priority *	Milestones	Start Date	End Date	Status **	Contact Person(s)	Affected Pubs/Standard	Remarks
G.1	Contribute and attend to a loading strategy workshop organized by ECDIS industry	M		2005		P	Mathias Jonas	S-52, App.2	
H.1	Contribute to common work of SNPWG and UNH, for NP3 presentation.	M		2005		P	Mathias Jonas	S-52, App.2	
I.1	Liase with TSMAD for symbols for new e 3.1.1 attributes .	H		2005	2006	P	Mathias Jonas	S-52, App.2 Annex A	
J.1	Liase with CSPCWG	M		2005		O	Mathias Jonas	S-52, App.2 Annex A	
K.1	Establish links at IHB server	M		2005		P	Michel Huet	S-52, App.2 Annex A	

Date	Location	Activity
18-20 May 03	Ottawa, Canada	14 th Meeting
2-4 May 05	Rostock, Germany	15 th Meeting
29-31 May 06	IHB Monaco	16th Meeting

5. DPSWG Work Plan (April 2004)

5.1 DPSWG Tasks

- A Complete IHO S-63 Data Protection Scheme documentation (IHO O3.1.1 refers).
- B Publish IHO S-63 and provide support (IHO O3.1.1 refers).
- C Monitor and support industry transition from Primar Security Scheme to IHO S-63 (IHO O3.1.1 refers).

Task	Work item	Priority *	Milestones	Start Date	End Date	Status **	Contact Person(s)	Affected Pubs/Standard
A.1	Complete S-63 Test Data	H			31.07.03	C	Jonathan Pritchard, UKHO	S-63
A.2	Review S-63 Confidentiality Agreement	H			31.07.03	C	Tony Pharaoh, IHB	
A.3	Handover of S-63 to IHB	H			31.07.03	C	Robert Sandvik, Primar Stavanger	S-63
B.1	Publish S-63	H		01.08.03	01.09.03	C	Michel Huet, IHB	
B.2	Provide S-63 technical support	H		01.08.03		O	Robert Sandvik, Primar Stavanger	
C.1	OEM S-63 transition guidelines and support	H		01.08.03		C	Robert Sandvik, Primar Stavanger	
C.2	Review feedback from industry/users on transition guidelines and agree support activities and work plans	H		22.06.04	23.06.04	P	Robert Sandvik, Primar Stavanger	

Date

22-23 June 04

Location

IHB, Monaco

Activity

Meeting scheduled to discuss feedback from industry and users and agree specific support activities. Review feedback on current S-63 documentation.

6. CSPCWG Work Plan

- *Tasks and Work Items are pursued in accordance with IHO Work Programme 2003-2007, Programme 3 (Techniques and Standards Support), Element 3.1 Nautical Cartography. In particular, the objectives: 3.1.1.1 the refinement and expansion of specifications and standards; 3.1.2 the development of standards for cartography and geographic information; 3.1.3 the development of the international [paper] chart series, including development of new symbology (3.1.3.1) and the extension of the INT chart scheme (3.1.3.3); task 3.1.1 the revision, development and maintenance of publications, including M-4 (Chart Specifications of the IHO) and M-11 (Catalogue of INT Charts).*
- *The focus is on maintaining and enhancing the cartographic standards in paper charts to suit the needs of the modern mariner in support of safe navigation, whilst drawing together, wherever possible, common issues of paper/digital charting.*

* H = High, M = Medium, L = Low

** P = Planned, O = Ongoing, C = Completed

- As a Plan it will and should evolve; accordingly, contributions from WG members and others are welcomed at any time. This version has evolved from that agreed at CHRIS 15; it shows progress since that plan, and includes plans (next milestones and dates) for continuing the work.

6.1 CSPCWG Tasks

- A Revise, develop and maintain Publication M-4 “Chart Specs and Regulations for INT Charts”, including creation of digital Version (IHO T3.1.1 refers) – *Revised digital version developed by UK and available on IHO website (April 2005).*
- B Revise, develop and maintain Publication M-11 “Catalogue of INT Charts” (IHO T3.1.1 refers) -
- *Part A produced by CSPCWG and available on IHO website (April 2005). New format and content for M-11 agreed with IHB.*
- C Review requirement for standardization of International Notices to Mariners (IHO O3.1.3.2 refers)
- *Completed. Follow-on work item at A.8.*
- D Development of new symbology (IHO O3.1.3.1 refers) –
- E Maintenance of M-4 supplementary publications INT 1, 2 & 3.

Task	Work item	Priority*	Next Milestone	Start Date	End Date	Status**	Contact Person(s)	Affected Pubs/Standard	Remarks
A.2	Revise M-4 Part B Section 100		Publish	2004	2005	C	Sec CSPCWG	M-4 / B-100	IHO CL 57/2005 (30 May 05)
A.3	Revise M-4 Part B Section 200	H	Include M/S feedback	2004	2005	O	Sec CSPCWG	M-4 / B-200	IHO CL 40/2005 (deadline for responses 22 Jul 05)
A.4	Revise M-4 Part B Section 400	H	Include M/S feedback	2005	2006	O	Sec CSPCWG	M-4 / B-400	CL 06/2005 – 1 st draft B-400-429; section divided for manageability
A.5	Revise M-4 Part B Section 300	L	Completion of A.4	2006		P	Sec CSPCWG	M-4 / B-300	Start after A.4 completed
A.6	Revise M-4 Part B Section 500	L	Completion of A.5			P	Sec CSPCWG	M-4 / B-500	Start after A.5
A.7	Revise M-4 Part B Section 600			2004	2005	C	Sec CSPCWG	M-4 / B-600	Lattice charts obsolescent. Removed from M-4. IHO CL 41/2005 refers (25 Apr 05)
A.8	New specification for Chart Maintenance section	L	Receipt of responses to CSPCWG 1 Action 15			P	Sec CSPCWG	M-4	Position in M-4 to be determined. To include NM criteria, print dates, thumb labels etc (B-252 round II comments refer)

Task	Work item	Priority*	Next Milestone	Start Date	End Date	Status**	Contact Person(s)	Affected Pubs/Standard	Remarks
B.1	Review S-48 and amalgamate within M-11	L	IHB to incorporate in M-11	2004	2004	C	IHB – M. Huet	M-11	CSPCWG action complete – IHO CL 37/2005. IHB to incorporate in M-11 and add to IHO web-site
C.1	Review requirement for the standardization of International Notices to Mariners;				2004	C	Chair CSPCWG		Consultation completed; no requirement for INT NMs. See new action A.8
D.1	Review and develop depiction of ESSAs (including PSSAs & ATBAs)			2003	2004	C	Sec CSPCWG	M-4 /B-437, INT 1	IHO CL 01/2005 (4 Jan 05)
D.2	Develop new symbology: ASLs			2003	2004	C	Sec CSPCWG	M-4/B-432, 434-436, INT 1	IHO CL 01/2005 (4 Jan 05)
D.3	Vessel Traffic Services guidance	L	Review of B -480	2005	2006	O	Sec CSPCWG	M-4/B-435 & 488	Requirement from IHC XVI, include review under A.4
D.4.1	Review and develop depiction of offshore wind farms (and other offshore renewables)			2004	2005	C	Sec CSPCWG	M-4, INT 1	IHO CL 14/2005 (2 Feb 05)
D4.2	Review symbology for Restricted Areas (inc Activities Inadvisable)			2004	2004	C	Sec CSPCWG	M-4, INT 1	IHO CL 01/2005 for Entry Prohibited (4 Jan 05). CL 13/04 summarised views on other proposals, none to be progressed at present; new work item required if re-submitted.
D.5	Review requirement for Fairway symbology	M	Discuss at CSPCWG 2	2004	2006	O	Vice Chairman CSPCWG	M-4, INT 1	New submission from FI May 2005 for review at CSPCWG 2
D.6	Review Wreck depth definitions	M	Review of sub-section B-420 – see A.4	2005	2005	O	Sec CSPCWG	M-4, INT 1	NL previously supplied suggested wording to CSC, included in B-420 draft revision; item A.4
D.7	Charted limits: styles, hierarchies, multi-feature lines	L	Draft by AU	2005	2006	P	C Roberts, AU	M-4B-439	CSPCWG 1 Action 21
D.8	Develop symbols for AIS-equipped AtoN	H	MS responses to IHO CL75/2005	2005	2005	O	Sec CSPCWG	M-4, INT 1	Proposed, developed and circulated to MS; IHO CL 75/2005 refers

Task	Work item	Priority*	Next Milestone	Start Date	End Date	Status**	Contact Person(s)	Affected Pubs/Standard	Remarks
E.1	New edition INT 1			2003	2005	C	S Spohn, DE	INT 1	Completed 18 Feb 05
E.2	New edition INT 2	M	Publication B-200	2005	2006	P	M de Graaf, NL	INT 2	CSPCWG 1 Action 33 – input required from WG members
E.3	New edition INT 3	M	Publication by UK	2005	2006	O	Sec CSPCWG	INT 3	NE in preparation by UK
E.4	Symbols for vacant entries in INT 1	L				P	Sec CSPCWG	INT 1, M-4 part B	
E.5	Small craft symbols	L				P	Sec CSPCWG	INT 1, M-4 part B	

Date	Location	Activity
3-5 November 04	Monaco	1 st WG Meeting
19-21 October 05	Monaco	2 nd WG Meeting

Secretary: Andrew Heath-Coleman. **Email:** coleman.andrew@ukho.gov.uk

7. SNPWG Work Plan

[Any remarks relevant to the understanding of the plan to be inserted here]

7.1 SNPWG Tasks

- A Decide on the Data Format of NP-data intended for use in ECDIS (NP3).
- B Define the content requirements of NP-data intended for use in ECDIS (NP3).
- C Develop basic display rules for NP-data intended for use in ECDIS (NP3).
- D Draft guidance documents
- E Revise technical resolutions as required
- F Liaise with other CHRIS WG's and other IHO and international bodies.

Task	Work item	Priority*	Milestones	Start Date	End Date	Status**	Contact Person(s)	Affected Pubs/Standard
A.1	Decide on the Data Structure of NPs-Data intended for use in ECDIS (NP3)	H	Decision for a Data Structure (June 2004)	2003	2004	C	Chair/Sec SNPWG	NP3 Data should be encoded as S57-objects which were modeled in UML
A.2	Look at existing systems on the market	H	June 2004	2003	2004	C	Chair/Sec SNPWG	
A.3	Evaluate the pros and cons	H	June 2004	2003	2004	C	Chair/Sec SNPWG	
B.1	Examine the content of traditional NPs	M	Content Specs (June 2004)	2004	2005	C	Chair/Sec SNPWG	Which NPs and NP data type should be included in NP3
B.2	Proposal discovery and distribution (BSH etc.)	M	Open- No deadline	2004		O	Chair/Sec SNPWG	Post discovery information on website
B.3	Draft Content Specs	H	2006	2004	2006	O	Chair/Sec SNPWG	In time to be included in S57 Ed4
B.4	Review Data Models	M	2006	2004	2006	O	Chair/Sec SNPWG	
B.5	Prepare Proposal for TSMAD	H	2006	2005	2006	P	Chair/Sec SNPWG	In time to be included in S100
C.1	Develop basic display rules for NP-data intended for use in ECDIS (NP3)	M	2007	2005	2007	P	Chair/Sec SNPWG	S52. Close Co-operation with CSMWG required.
D.1	Data Capture Guidance	M	2007	2006	2007	P	Chair/Sec SNPWG	S100. Document like Use of the Object Catalogue for NPs
E.1	Revised Technical Resolutions, as required	M	2007	2007	2007	P	Chair/Sec SNPWG	Technical Resolutions
F.1	Liaise with the CSMWG for the development of the display rules	M	2007	2005	2007	O	Chair/Sec SNPWG	S52
F.2	Liaise with TSMAD	M	2007	2004	2007	O	Chair/Sec SNPWG	S57
F.3	Liaise with other relevant WGs	M	2007	2004	2007			

* H = High, M = Medium, L = Low

** P = Planned, O = Ongoing, C = Completed

Date	Location	Activity
7-9 June 04	NOAA, Silver Spring, MD, USA	3 rd Meeting
1-3 March 05	IHB, Monaco	4 th Meeting
24-28 October 05	Copenhagen, Denmark	5 th Meeting

8. DQWG Work Plan

This WG is currently dormant

9. HGMIO Work Plan

As a technical liaison Working Group that is a subsidiary of two Committees (IHO CHRIS and IEC TC80), the primary purpose of HGMIO is to harmonize the activities of IHO and IEC related to the provision and display of supplemental chart- and navigation-related information on ECDIS. As agreed at HGMIO 2 (on 14 June 2003), the primary focus will be to assess the current status of previously developed or proposed IHO S-57 objects/attributes and display aspects for:

- Ice Information;
- Tides and Water levels;
- Oceanographic;
- Meteorological;
- Marine Environmental Protection;
- Aids to Navigation Status

Other potential topics for future investigation could include:

- Current Flow;
- Right Whales

9.1 HGMIO Tasks

- A For each MIO category, describe the current status of development efforts (e.g., data or display-related), and assess level of further development required.
- B Recommend to TSMAD and C&SMWG MIO-related matters that warrant consideration for inclusion in next editions of S-57 and S-52.

Task	Work item	Priority *	Milestones	Start Date	End Date	Status **	Contact Person(s)	Affected Pubs/Standard
A.1	Ice Information	M	Work Item agreed at HGMIO 2	Fall 03	Mar 06	P	Canadian Hydrographic Service (Ottawa) John Falkingham, Ice Services Canada	S-57 & S-52
A.2	Meteorological	L	Work Item agreed at HGMIO 2	Fall 03	Unkn.	P	Michel Huet (IHB) and Dan Pillich (SevenCs)	S-57 & S-52
A.3	Tides/Water Levels	L	Work Item agreed at HGMIO 2	Fall 03	Unkn.	P	Lee Alexander (Univ. of NH)	S-57 & S-52
A.4	Oceanographic	L	Work Item agreed at HGMIO 2	Fall 03	Unkn.	P	Max van Norden (US Naval Oceanographic Office)	S-57 & S-52
A.5	Current Flow	L	No tasking or volunteer	-	-	-	TBD	-
A.6	Aids to Navigation Status	M	Work Item agreed at HGMIO 3	Jul 05	Dec 07	O	Michel Huet	S-57 & S-52
A.7	Marine Environmental Protection	M	Work Item agreed at HGMIO 3	Jan 05	Jan 08	O	Julia Powell	S-57 & S-52
B.1	Recommend to TSMAD MIO-related matters that warrant consideration for inclusion in next edition of S-57	L	Work Item agreed at HGMIO 2	Jan 04	Unkn.	O	Lee Alexander (Univ. of NH)	S-57 Ed. 4.
B.2	Recommend to C&SMWG MIO-related matters that warrant consideration for inclusion in next edition of S-52	L	Work Item agreed at HGMIO 2	Jan 04	Unkn.	O	Lee Alexander (Univ. of NH)	S-52 App.2, Ed. 4

Date	Location	Activity
14 June 03	IHB, Monaco	2 nd Meeting
27 June 05	IHB, Monaco	3 rd Meeting

* H = High, M = Medium, L = Low
** P = Planned, O = Ongoing, C = Completed

**Report of the ECDIS Stakeholders Forum held in Rostock,
6 - 7 September 2005 in conjunction with 17th CHRIS meeting.**

By Cor Mallie, Commander RNIN (ret).
Managing Director of Chartworx Holland BV.

As a follow-on from the two-yearly event "Industry Days" that in previous years took place at the International Hydrographic Bureau in Monaco, the event this year was renamed "ECDIS Stakeholders Forum" and took place in Rostock, Germany, with support provided by the Rostock office of the German Hydrographic Service (BSH). The meeting took place in conjunction with the annual meeting of the IHO Committee on Hydrographic Requirements for Information Systems (CHRIS) with representatives from 24 IHO Member States. As such it provided an excellent opportunity to discuss some important issues between the International Hydrographic Organization (IHO) and those involved in ECDIS manufacturing, data distribution, data validation and data production software developers, and representatives of other organizations representing the interests of the ECDIS user.

Introduction.

The meeting was chaired by Captain Robert Ward (RAN), Chairman of CHRIS, who welcomed the 74 participants, i.e. 32 from "Industry" and 42 from IHO, and gave a brief introduction on the organisation and status of the IHO and the work of the now 76 Member States being undertaken by the different committees and work groups. Particular attention was drawn to the possibility for accredited "Non Governmental International Organisations" (NGIO's), that were able to make a substantial contribution to the work of the IHO, to be granted "Observer Status". This was agreed at the 3rd Extraordinary Conference of the IHO in April 2005.

However, the Chairman emphasized the need for expertise from industry to support the IHO working groups and that the present procedure of inviting experts from outside would be continued.

The agenda of the meeting showed two major items for which the input, co-operation and support of the stakeholders were essential to reach a successful solution. The first issue being the proposal for a new edition of IHO Special Publication 57 (IHO S57) which is the Transfer Standard for Digital Hydrographic Data and the second issue being the implementation of new editions of the IHO ECDIS Standard S-52, Appendix 2, Colour and Symbol Specifications and its Annex A, the IHO Presentation Library for ECDIS, both released in March 2004.

S-57 Edition 4 – A new standard for hydrographic environmental data.

Barrie Greenslade from the Hydrographic Office of the United Kingdom (UKHO) and member of the Transfer Standard Maintenance and Applications Development (TSMAD) Working Group explained the necessity to revise S-57 edition 3.1. The present standard and its associated ENC Product Specification has been "frozen" since 2001. Since then numerous deficiencies have come to light and it appeared that several features had been overlooked when the standard was written e.g. areas with minimal bathymetric data, information areas, IALA special purpose buoys and beacons. Also some features have been added in recent years, such as Archipelagic Seaways, AIS transmitters on aids to navigation, Particularly Sensitive Sea Areas (PSSA) etc. A number of these features have been mandated by the IMO for inclusion on charts and are already on paper charts but, unfortunately, cannot yet be displayed on ECDIS because of the present rigid, inflexible standard. The idea is that the new standard should no longer be considered a standard just for electronic navigation, but should also cater for all digital hydrographic requirements and facilitate interoperability with other GIS standards. It should also allow HO's to use other sources of geospatial data. The S-57 (Edition 4)¹ should be able to accommodate a wider range of digital data sources, products and customers. This includes matrix and raster data, 3 dimensional and time varying data, bathy ENC, Inland ENC, seafloor classification data, Marine Information Objects (MIO's), Additional Military Layers (AML) etc. Edition 4 will not be an incremental revision of the present edition but a complete new standard. The new IHO S-57 will be developed following the "ISO" way of standards in alignment with the ISO 19100 series of geographic standards. This will require a complete new structure and a new (or revised) set of terms used to describe the components of S-57 Edition 4.

¹ Subsequently re-numbered S-100, with target date of end 2007 for publication.

The primary target is to complete the new standard by the end of 2007. It was made very clear by the Chair that the actual implementation, in terms of ENC Product Specification, would probably not be before 2010 / 2012. Furthermore, it was stressed that no decision had yet been made to supersede or replace the current S-57 edition 3.1 ENC Product Specifications².

The Stakeholders.....

Understandably the proposed revision of the standard triggered an animated discussion that continued almost until the closing of the meeting.

Generally all stakeholders stated that the proposed far-reaching change of the standard and the inherent Product Specification³ would necessitate a requirement to amend the system software and, as the old standard had to be supported for probably a number of years yet, it would require another type of "dual" fuel provision. This would require considerable investment by the ECDIS manufacturer and very likely a renewal of the type approval certificate with again financial consequences. It would be difficult to recharge some of these costs to the customer as they might comment that they were not waiting for a new standard, but rather for more and better quality data. The attention of the CHRIS Committee was drawn to the fact that recently the IMO Sub-Committee on Safety of Navigation agreed to make ECDIS mandatory for High Speed Craft. The proposed amendments will be considered by the Maritime Safety Committee (MSC) at its 81st session in May 2006. As for the mariner S-57 is synonymous with ENC, and to let this initiative coincide with a rigorous change of the standard, at this moment in time, could be detrimental and would provide further ammunition for the anti-ECDIS lobby.

ENC Data Consistency.

Graham Reek, Technical Manager of IC-ENC (International Centre for ENC's) provided an overview of major problems with ENC's. Particularly neighbouring cells at international borderlines showed in some cases unacceptable discrepancies like holes in between cells, broken off contour lines, cables that abruptly stopped at the boundaries, wrecks being depicted twice etc. He recommended Hydrographic Offices (HO's) to liaise closely and to ensure a good match and consistency of adjacent cells at borderlines before submitting them to the RENCs. Standard contour lines must be shown in all cells. Inconsistency in encoding the data could be avoided by all HO's using the same usage band i.e. overview, general, coastal, approach, harbour and berthing for same adjacent border cells. Wherever possible "Category of zones of confidence in data" (CATZOC) other than "Unassessed" should be allocated. It does not increase the confidence of a mariner in his ECDIS as it continuously displays series of "U's" on his monitor.

Some IHO representatives added that the need for better ENC consistency is not new, it has been brought to the attention of the HO's many times. Furthermore an ENC recommendation paper has been posted on the IHO web site for some time, but they are only recommendations, not requirements. It is also a matter of different approaches to cartography of adjacent HO's. There are now about 30 countries producing ENC's. Some sell through a RENC, some not.

The Stakeholders.....

One of the participants felt that Graham Reek's presentation was a useful "pep talk" for the HO's. Ugly ENC's are hard to sell and damaging the ECDIS concept. CATZOC may not always be so useful and is causing more problems than it solves. If the data is unsafe for navigation, just don't sell it. We should realise that there is considerable competition from commercial electronic chart data producers, their product being much better fine tuned, more consistent and uniform, and it looks better than ENC's in ECDIS. The IMO member states are also advised to make their data "good looking". The RENC's should be given more power and be given some allowance to modify the data like more flexibility in minimum scaling and moving an edge so that ENC's match. Graham Reeks commented that the IC-ENC would like to do this but there are liability concerns. One of the major chart agents mentioned that bad looking ENC's are a major problem. As a chart distributor, it is difficult to convince customers to use ENC's if they are not happy with the appearance. Going to Edition 4 may be OK, but it should not have a detrimental effect on ENC's, the real demand is coverage and consistency, not increased functionality like for instance 3-D. Shipping companies are primarily interested in data coverage, quality and pricing. The Stakeholders understand that the Hydrographic Community

² Afterwards, it was agreed that an interim, limited edition 3.1.1 of the ENC PS would be produced for 2006.

³ Subsequently re-numbered S-101, with target date of end 2012 for publication.

realises that there is a problem but that does not help us in explaining to our customers why, in some areas, the data does not meet the standard they require in return for their money.

The Chairman drew the attention of the attendees to the fact that CHRIS is a technical committee tasked with technical issues. The quality and the coverage of the ENC's is as such not a subject for this meeting. However, he considered the discussion as a valuable reality check and fully agreed that the status quo was not acceptable but there was no simple solution. The only way was to approach the individual HO's and advise them about the unsatisfactory situation regarding the status of the ENC's.

S-52 ECDIS Symbology: Where to Next?

Mathias Jonas (BSH), Chairman of the IHO Colours & Symbols Maintenance Working Group, presented a status report and discussed future challenges for the Presentation Library. The colours and symbol specifications have been replaced by a new edition 4.2 and the presentation library by a new edition 3.3. The latter marks a considerable change in format, as it is now also available as a printable document. This unique hard copy of the library has about 600 pages, i.e. one symbol description per page. So we can now see how an ECDIS should look.

The present Presentation Library has over the years reached a consolidated and accepted status. It provides a good foundation for the visualisation of ENC's. A number of smaller problems of the preceding editions have been solved.

ECDIS systems to be type approved for the first time after 1st January 2005 must conform to Edition 3.3 of the Presentation Library from 1st July 2005. ECDIS systems already type approved as of 1st January 2005 should update to edition 3.3 at the earliest opportunity, but not later than 1st January 2006.

Ships already fitted with ECDIS should upgrade at the earliest opportunity.

The issues presently on the table are:

- gaining the technical expertise to move Colours and Symbols forward.
- do we continue to move forward slow, moderate, or great?
- the significant shortcomings on what is done now (e.g. the display of Particularly Sensitive Sea Area's (PSSA), Port Security Limits etc.).

The Stakeholders.....

An interesting discussion followed this presentation. It was mentioned that the original intent of type approval was that if the symbols look enough like the printed version, then this was acceptable. The IHO Colours and Symbols should be a minimum specification, not the only or best way. Freezing a standardised solution has disadvantages: it restricts the fast introduction of new advanced hardware and monitor technology. It will also restrict the competition between ECDIS manufacturers to the layout. On the other hand, identical look and feel of chart display of different makes has definite advantages for safety of navigation. It eases ECDIS development and operation, it allows certification, it facilitates standardisation of education and it avoids ambiguity. For safety of navigation there is a steady need to standardise chart information similar to the paper chart. It is not possible for the IHO to release control of the electronic chart display in full as it is not likely that IMO would accept a diversity of chart displays.

For a complete refit of the Presentation Library, IHO could hire a consultant who would travel around all of the OEMs that are interested in contributing. Meanwhile the Presentation Library will be maintained on a low level with minor corrections and amendments to be discussed by correspondence. And a Moratorium until S-57 edition 4 is ready to go.

Again the question arose about how and when to upgrade the existing ECDIS systems for the latest introduced new editions. And do we need renewal of existing type approval and who is going to pay for it. Who is responsible? It was mentioned that manufacturers cannot be held responsible for the life of the equipment. Ships change owners, managers, and personnel. Making manufacturers responsible for periodic upgrades is not practical. It is the ship owner under the ISM code that is ultimately responsible. Perhaps the IMO would need to be kept informed by the IHO as to what upgrades are needed. One manufacturer commented that since ECDIS was not a mandatory piece of

equipment, mandatory upgrades were not feasible. It was advised by one of the attendees that probably the users of ECDIS, type approved before 1 January 2005, could be informed about the necessary upgrade by Notices to Mariner.

Wrapping up the S-57 update issue.....

The Chairman put to the attendees the question whether it was acceptable to live with an ECDIS screen full of asterisks and question marks until the introduction of Edition 4⁴ probably between 2010 and 2012. All agreed that this was not acceptable and a minor interim solution was needed. The audience in general agreed that an interim solution in the form of S57 e3.1.1 was necessary. This could be introduced in 2007 / 2008. Introducing e3.1.1 would make it possible to show, for instance, Particularly Sensitive Sea Areas and Archipelagic Sea Lanes as required by the IMO. For ECDIS systems only a minor software update would be required to display e3.1.1. features. In ECDIS which has not been updated, the new feature will show as a question mark. In this case further information could be obtained using the "Information" attribute and the "Pick Report" functionality.

Many Stakeholders expressed their concern about the implication in the market of the announcement of S-57 edition 4, particularly as many people consider the S-57 standard to be the same as the ENC Product Specification. It was therefore proposed by TSMAD to change the name to S-100. This is also to emphasise that it is a complete new transfer format with a much wider application, a flexible structure and taking advantage of new technologies. S-100 would probably be available in 2007, but it was stressed that ENC's created with this Transfer Standard would probably not become available until 2012.

Open ECDIS Forum

The Chairman put forward the question whether this web site, presently sponsored and upgraded by the IHO, can also be used for any other purpose. In a short discussion it became clear that the site should continue to exist in its present form and that the planned renovation is underway.

Closing remarks.

The Chairman mentioned that the next CHRIS meeting will take place in September next year in Sydney, Australia and that calling for another Stakeholders meeting in conjunction with this meeting might not be so practical. The majority of the Stakeholders expressed the wish that the next meeting be in conjunction with a meeting of the WEND Committee. This would enable them to voice their concerns about the quality and quantity of ENC and other pressing issues from the user perspective like licensing and pricing, distribution, a proper loading strategy and discuss possible ways to improve the present situation.

The Chairman concluded that he considered the meeting extremely useful. He expressed his thanks in particular for the input from the non-IHO representatives and confirmed that, although no decisions from the outcome of the meeting were yet taken, all that had been said would be taken into consideration. Finally he mentioned that the next TSMAD meeting would be in November, and that it would be very useful to have some input from non-IHO representatives as TSMAD is desperately short of expertise in certain areas.

Author's Note:

Just before these notes were forwarded to Hydro International and the IHB, the IHO very kindly sent copies of 2 letters they distributed to their members, i.e. CLs 93 and 94/2005. The first one announcing that the new Data Transfer Standard revision was not to occur before 2012 and that a minor revision (S-57 e3.1.1) would be introduced to accommodate new requirements. This revision will also add "placeholders" that can be used to accommodate any other new features the IMO may require in the future. The second one informs the member states that CHRIS has decided that the S-57 Edition 4 (currently still under development) will henceforth be known as S-100. The ENC Product Specification based on S-100 will be known as S-101.

Conclusion: A well chaired, worthwhile and pleasant meeting between the IHO and Industry fully meeting its target: "to provide input, co-operation and support of the stakeholders to arrive at a successful solution".

⁴ of the ENC Product Specification, i.e. S-101.

ECDIS STAKEHOLDERS' FORUM
6-7 September 2005, Rostock, Germany

LIST OF PARTICIPANTS

INDUSTRY / ACADEMIA / INSTITUTIONS		
Name	Representative	E-mail
Atlas Elektronik	Peter DUGGE	dugge.p@atlas.de
Austrian Waterway Administration	Dieter HINTENAU	dieter.hintenaus@via-donau.org
Caris B.V.	Geerten BLESSING Hans VAN OPSTAL	gblessing@caris.nl vanopstal@hetnet.nl
ChartCo, UK	Steve MARINER	steve.mariner@chartco.com
Chartworx Holland, Netherlands	Cor MALLIE	cor@chartworx.nl
CIRM	Michael RAMBAUT	secgen@cirm.org
C-Map Italy	David D'AQUINO	ddaquino@c-map.it
Furuno	Hannu PEIPONEN	hannu.peiponen@furuno.fi
IC-ENC, UK	Graham REEKS	graham.reeks@ic-enc.org
IIC Technologies, Canada	Gwil ROBERTS	gwilr@iictechnologies.com
Japan Hydrographic Association	Shigeshi MIMURA	mimura@jha.jp
Kelvin Hugues, UK	Yiorgos PALIERAKIS	yiorgos.palierakis@kelvinhughes.co.uk
Marine Press Canada	George ARTS	George.Arts@marinepress.com
Maritime & Coastguard Agency, UK	Joe COLLINS	joe.collins@mcga.gov.uk
Ministry of Transport, Austria	Bernd BIRKLHUBER	bernd.birkhuber@bmvit.gv.at
QPS, Netherlands (also representing HITT BV and Ican Ltd)	Jeroen den HERTOOG	hertog@qps.nl
Sahara Energy, Nigeria	Tonye COLE	tonye.cole@sahara-group.com
SAM Electronics	Bernhard NÖGGERATH Wolfgang PIEPER	Bernhard.Noeggerath@sam-electronics.de Wolfgang.Pieper@sam-electronics.de
Serendipity Unltd., Netherlands	Peter KLUYTENAAR	peter@serendipity.nl
SevenCs, Germany	Gert BÜTTGENBACH Eric ROTTMAN	bue@sevencs.com ro@sevencs.com
Thales Naval Nederland BV	Dick van HARTEN	dick.vanharten@nl.thalesgroup.com
T-Kartor, Sweden	Ole BERG Frederik DAVIDSSON	olb@t-kartor.se fd@t-kartor.se
Transas Ltd., Russia	Vladimir SEKACHEV Konstantin IVANOV	vladimir.sekachev@transas.com konstantin.ivanov@transas.com
Troil Marin, Finland	Eric von TROIL	Eric.Troil@troilmarin.com
Univ. of NH, USA	Lee ALEXANDER	Lee.Alexander@unh.edu
Wasser und Schifffahrtsdirektion, Germany	Jörg VOGEL	j.vogel@wsd-sw.wsv.de
Wismar Univ., Germany	Sven HERBERG	s.herberg@sf.hs-wismar.de

INTERNATIONAL HYDROGRAPHIC ORGANIZATION		
MS / IHB	Name	E-mail
Australia (RAN)	Robert WARD, Chair Gordon HOMES	robert.ward@hydro.gov.au gordon.homes@defence.gov.au
Canada	Don VACHON	vachond@dfo-mpo.gc.ca
China	Michael CHAU	michael@hydro.gov.hk
Estonia	Tõnis SIILANARUSK	tonis.siilanarusk@vta.ee
Finland	Tiina TUURNALA Juha KORHONEN	Tiina.Tuurnala@fma.fi Juha.Korhonen@fma.fi
France	Michel EVEN	even@shom.fr
Germany	Mathias JONAS Johannes MELLES Jochen RITTERBUSCH	mathias.jonas@bsh.de johannes.melles@bsh.de jochen.ritterbusch@bsh.de
Greece	Alexis HADJANTONIOU	dcd@hnhs.gr
Italy	Massimiliano NANNINI	nanninim@marina.difesa.it
Japan	Toru KAJIMURA	tooru-kajimura@kaiho.mlit.go.jp
Korea (Rep. of)	Wonkyung KIM Jinkwang BOUK Jongmin PARK	katusa127@hotmail.com jgbok@nori.go.kr pjm@kriso.re.kr
Netherlands	Ellen VOS Jan SCHAAP	em.vos@mindef.nl j.schaap2@mindef.nl
New Zealand	Michael FARRELL	mfarrell@linz.govt.nz
Nigeria	Ayo OLUGBODE	molugbode@yahoo.com
Norway	Ole B. KVAMME	Ole.b.Kvamme@statkart.no
Singapore	Parry OEI	parry@mpa.gov.sg
Slovenia	Igor KARNICNIK	igor.karnicnik@geod-is.si
South Africa	Abri KAMPFER	hydrosan@iafrica.com
Spain	Angel CHANS	ihmesp@retemail.es
Sweden	Peter SUNDBERG Hans ENGBERG	peter.sundberg@sjofartsverket.se hans.engberg@sjofartsverket.se
Thailand	Katanyu S RITANGNAN	hydrotech@navy.mi.th
United Kingdom	Chris SMITH Peter JONES Barrie GREENSLADE Peter COX Chris DRINKWATER	Chris.Smith@ukho.gov.uk Peter.Jones@ukho.gov.uk Barrie.Greenslade@ukho.gov.uk Peter.Cox@ukho.gov.uk chrisdrinkwater@btinternet.com
USA (NGA)	Christian ANDREASEN	AndreasenC@nga.mil
USA (NOAA)	Dave ENABNIT Michael BROWN Julia POWELL	Dave.Enabnit@noaa.gov Mike.Brown@noaa.gov Julia.Powell@noaa.gov
USA (USCG)	Jim RADICE	James.T.Radice@uscg.mil
USA (ACOE)	Denise LADUE	denise.r.ladue@usace.army.mil
IHB	Kenneth BARBOR Michel HUET	kbarbor@ihb.mc mhuet@ihb.mc

