

4<sup>th</sup> CSPCWG MEETING  
Monaco, 13-15 November 2007

15th TSMAD MEETING  
14-18 Jan 2008 in Monaco

*Updated 24 Sep 07*

**Report to TSMAD15 regarding the review of M-4 (ongoing)**  
(following CSPCWG2 Record of the Meeting in October, 2005)

(The following report and the related spreadsheet is CSPCWG ACTION 33 (ongoing) to the record of the CSPCWG3 meeting held in 2006).

**Please note that this report is the opinion of Roberts as a member of CSPCWG and suggestions are not necessarily the official views of the IHO CSPCWG.** This report is still in draft form and will be further updated after CSPCWG4 for the TSMAD15 meeting in January, 2008.

**Introduction:** Several reports have been provided by AU to TSMAD over the last few years regarding the ongoing review of M-4. This review is expected to continue for at least another couple of years and as the IHO chart specifications are updated for consistency and new features are encountered, there are numerous changes and additions being made to both M-4 and INT1. Both of these IHO documents are widely referenced throughout the S-57 Object Catalogue and will also apply to S-100 and S-101 and probably some of the other new product specifications adopted in relation to S-100. But more important than cross referencing, there are also numerous new features that are now charted, which need to be considered for the S-100 Hydrographic Feature Data Dictionary and register. The M-4 review has turned out to be far more involved than many expected and the results so far have included new and amended symbology, new INT 1 entries, new and amended definitions, additional requirements for some features (could drive new attributes and enumerates for S-100 FDD), new charting conventions, new terminology to agree with S-57 (use of ‘must’, ‘should’ and ‘may’), new clauses within M-4 (which may need to be referenced for S-101 UOC equivalent), closer liaison with CSMWG regarding colours of charted features and new symbols.

The following sections of M-4 have already been reviewed:

B-100

B-200

B-400 to 429

B-430 to 439 (M-4 Edition 3.004 was published in July 2007)

Section B-440 to 449 has just undergone its third round of review and is expected to be approved by IHO member states late 2007 for possible publication early 2008.

Section B-450 to 479 on navigational marks is expected to commence late 2007

Future sections include B-480-499, B-300 (topo), B-500 (geographic names), new section on chart maintenance.

M-4 was the foundation document for the S-57 Use of the Object Catalogue and accordingly, it is anticipated that it will also be widely used for the S-101 ENC Product Specification.

The attached spreadsheet (TSMAD15-##) lists many of the changes and additions that have been approved by member states to M-4 (and INT1) to date. In some cases, new features, attributes or

enumerates are also suggested, but in many other cases, the issue will need to be further investigated by ENC encoding experts before formal proposals are made to the Hydrographic Register. There is a huge amount of work to be done, in the vicinity of man months, and this will require research by those with an intimate knowledge of M-4 and S-57 in particular.

#### **TSMAD actions to date:**

At TSMAD 13 item 9.2, an **action** was approved for issues within the body of the paper TSMAD13-9.2Rev1 to be addressed by the new S-101 SubWg. A related action to item 10.3 regarding revised definitions of S-57 object and attribute classes was referred to the IHO CHD. At TSMAD14 in the review of TSMAD13 actions, no mention of the former item, however it was raised again in item 10.2 where a further **action** was approved for the review by the FDD sub-group when the content of the Hydrographic register is being reviewed (based on S-57). There was also a report in item 12.3 that the revised definitions sent to CHS will be an Annex to S-32 and that the matter would be referred to CHRIS19.

As at September, 2007, AU is not aware of any action having been commenced by the FDD sub-group and the Hydrographic Feature Data Dictionary Register is still not available to make proposals. The report on the issues from M-4 and INT1 has been further enhanced to include further review and new editions of M-4 and will be submitted as TSMAD15-## (see separate spreadsheet). There are currently about 300 line items that need to be addressed, some requiring further investigation depending on the direction that S-101 takes in its development. This will grow even further, possibly double as the remainder of B-400 and B-300 are reviewed.

TSMAD is reminded of a historical **action** from the S-57 Extensions SubWg6, item 4.9 in **April 2004**, for all TSMAD MS to review portions of the existing S-57 object catalogue in a database form against the original published version for errors or clarifications. This task was never allocated and remains as a huge task for S-100.

#### **Examples:**

The following issues are examples of items discussed at CSPCWG meetings that relate to matters affecting S-57 and or S-100/101.

The bracketed references refer to the section number in the official CSPCWG2 Report. (This Report and associated papers can be downloaded from the IHO website (CSPCWG section) for more information, if required).

**Refuge buildings** (CSPC2 8.3i) (proposed future B-370.8): could be considered as an additional enumerate for FUNCTN = refuge

**Ice coastline** (CSPC2 8.3iii) (changes have been drafted to B-449.1 (in round 3), but not as yet approved by member states): a date for the known extents of an ice coast or glacier have been suggested. New attribute DATEND or SUREND (or both) could be added to **COALNE** for S-100, or such features may have already been considered for Ice Objects (separate IHO register?). There may need to be discussion between the relevant register managers and or WGs on how such features will be charted.

**Mangrove coasts and 'islands'** (CSPC3 8.2): CSPCWG4 will decide on whether mangrove areas should be portrayed as intertidal (green), or continue to be shown as land areas (buff). The outcome may influence various ENC encoding for S-101.

**Vessel Traffic Management System** areas (VTS) (CSPC2 8.5.2): currently no specific S-57 object class, so **ADMARE** is suggested as being appropriate for S-57 ENCs, using

INFORM and or TXTDSC. Possible candidate for a new feature for S-100 FDD **VTSARE**. Could be considered as a possible ENC Encoding Bulletin of FAQ.

**Synchronized and sequential lights** (CSPC2 8.6 and CSPC3 8.5): CSPCWG agreed that the abbreviation ‘sync’ was reasonably intuitive, and although sequential lights are not strictly synchronized, it was decided that the abbreviation would be used on paper charts to cover both cases. M-4, B-478.3 will be amended and a new entry in INT 1 section P will be determined. Currently S-57 has attribute STATUS = 15 (synchronized) but no entry for sequential. Do we alter the definition of synchronized to include sequential. Personally I think the two terms should remain separate and distinct for S-100. We have a binding here for S-100 between 2 attributes LITCHR and STATUS and a possible new collection object ‘synchronized lights’. See also PEL below where such terms could be regarded as a light characteristic (LITCHR)?

**Port Entry Lights** (PEL) with oscillating sectors (8.7): M-4 B-475.7 and INT 1 P30.4 are to include PELs eventually. A draft ENC encoding bulletin was prepared by UKHO (TSMAD13-8.1) which it with the TSMAD SubWg for ENC Encoding Bulletins and FAQs. However for S-100 do we require a new attribute value for LITCHR for oscillating? Should it be considered for STATUS, similar to ‘synchronized’? It may also be another example of binding between 2 attributes LITCHR and STATUS.

**Digital GPS stations** (8.8): will be added to INT 1 S51 (similar to BSH INT 1 Sa national symbol) and M-4 will be reviewed (B-481.5). S-57 already has CATROS = 10 (DGPS) to encode these, but these new references will eventually need to be added for S-100 FDD. Update from the Secretary of the CSPCWG: Looking at the S-32 definitions for radio stations and radio beacons, the difference is not really apparent. A radio beacon is transmitted from a radio station. From a chart user perspective, the important issue is that it is a stationary, physical feature. Peter Jones (Chair CSPCWG) and I assessed again the place marker we put down for M-4 and believe it is still the most obvious place. We have to question why the attribute CATROS is allowable against **RDOSTA** but not against **RTPBCN**. It is strange that I cannot find a radiobeacon (as opposed to a radar transponder beacon) in S-57, although M-4 and INT1 lists various radiobeacons. For S-100, it is suggested that all the issues mention here need further investigation by experts in this field.

**Geographical positions** conventions (9.1): CSPCWG has provided specifications on where to place the minute symbol in relation to the decimal point (of a minute). See new M-4 B-131. TSMAD may consider this format for S-100 to provide consistency across products.

**Height, elevation and vertical length** terminology (9.2): CSPCWG has removed part of M-4 B-302 to reduce confusion. TSMAD will need to carefully review these terms and definitions for S-100 FDD and provide consistency. Consideration should also be given to referring these definitions to the IHO CHD and TSMAD needs to refer to IHO TR 2.5A in particular when reviewing these terms.

**Dangerous and non-dangerous wrecks** (9.3): major changes have been made to M-4 B-422.5 and 422.7 in particular (published), giving precedence to HOs estimating a safe clearance of all wrecks in water less than 200m. The terms ‘dangerous’ and ‘non-dangerous’ applying to wrecks, have been removed from M-4 as generally it depends on the underkeel clearance whether a wreck is considered to be dangerous or not. S-57 currently uses CATWRK to encode dangerous wrecks (value 2) and non-dangerous wrecks (value 1). Should these values be prohibited for ENCs following M-4 for paper charts? We also have QUASOU 7 = least depth unknown, safe clearance at value shown. However the only attribute value to specify ‘estimated’ is the spatial attribute QUAPOS (value 9). HOs may be reluctant to encode value 7 because of liability issues, as value 7 infers a safe clearance.

Is a new value of QUASOU or TECSOU required such as 'estimated depth'. TSMAD may need to consider bindings between geo and spatial attributes for S-100 – QUASOU and QUAPOS as an example.

The description of this attribute 'Quality of sounding measurement' also needs to be reviewed, as HOs are now portraying 'estimated depths', which are not sounding measurements as such. For S-100, should this attribute be termed 'Quality of depth – QUADep'? Other odd values also are in this category eg. value reported (not surveyed). Total review, possibly be the newly formed DQWG may be required for S-100 together with all 'quality' features and attributes for both hydro and land features.

Do we also need to consider attribute enumerates 'dangerous' and 'non-dangerous' for other features for S-100 as we use such terms with obstructions, water turbulence and underwater rocks, etc. If so, can we adopt an existing attribute such as STATUS or do we need a new attribute.

Comments by the Secretary of CSPCWG: Following all the CSPCWG discussions, we think it is very important to eradicate the term 'non-dangerous wreck' from all IHO documents. More appropriate would be 'wreck of unknown depth' and 'wreck of unknown depth considered to be dangerous to some surface vessels'. INT1 K29 should be used for wrecks in water over 200m - K28 includes a danger line and blue tint, whatever the depth.

**Unsurveyed areas (9.7):** a new section has been added to B-418, including a new definition which has been sent to CHD for approval. It is suggested that CATZOC should not apply to unsurveyed areas and this should be advised via an ENC Encoding Bulletin (using 'should not' strength of wording). Alternatively, this matter could also be referred to the DQWG for development for S-100/S-101.

### **Conclusion:**

The specification relating to the compilation of charts is in a state of development with some significant changes (such as to wrecks) and additions (such as waiting areas). Most HOs use paper charts as the main source for ENCs, and even when ENCs are compiled from source documents, reference is still made to M-4. The IMO Performance Specifications for ECDIS states (in 1.4) "ECDIS should be capable of displaying all chart information necessary for safe and efficient navigation originated by, and distributed on the authority of, government authorized hydrographic offices". (Note that 'should' in IMO documents means 'must' in S-57 speak). And in 1.7 "ECDIS should have the same reliability and availability of presentation as the paper chart published by government authorized hydrographic offices". (Note that both sections are still in the revised draft which will be approved by IMO this year).

S-57 is frozen and is now being left behind as M-4 is further updated and developed. S-101 is planned for preliminary draft publication is late **2008** but is not expected to be operational until at least **2012**. TSMAD needs to take care that we do not react fast enough to other charting specifications as it may lead to HOs not being fully compliant with the IMO Performance Specifications for ECDIS. S-57 encoding rules have become cumbersome and we must ensure that we learn from the problems with S-57 maintenance and come up with a much clearer advice mechanism for S-101 changes and additions. But as long as S-57 remains frozen, there will be issues trying to encode new features as S-57 ENCs in a way that may not be possible within S-101 ENCs. The translation from S-57 to S-101 may be cumbersome for new features encoded in S-57 ENCs.

The IHO Committee for the Hydrographic Dictionary (CHD) has started up a discussion forum at [www.iho-discussions.org](http://www.iho-discussions.org) which already includes suggestions that will affect the S-100 FDD. Members of TSMAD with an interest in definitions are encouraged to register on this site and participate. Perhaps there also needs to be more formal arrangement made between TSMAD and

CHD, so that TSMAD is informed of changes or proposals likely to affect the Hydrographic register. This matter could also be raised at CHRIS?

**Recommendations:**

TSMAD needs to start work on the S-100 Hydrographic Data Dictionary, particularly to reviewing those definitions that relate to hydrographic terms as the IHO is the authority in these matters. It is recommended:

1. All hydrographic terms within the S-57 Object Catalogue for which the IHO purports to be the expert, be reviewed for S-100. As a guide, please refer to TSMAD papers by AU presented in 2003 on 'Hydro authoritative S-57 objects' and 'Hydro authoritative S-57 attributes'. This may be carried out in conjunction with the IHO CHS (S-32).
2. That at least all the new features added to M-4 (see TSMAD15-##B and some of those important issues affecting safety of navigation, mentioned above) be examined by the TSMAD SubWg as possible ENC EBs or FAQs for S-57;
3. Someone within TSMAD be made responsible for following the new IHO discussion site [www.iho-discussions.org](http://www.iho-discussions.org). and raise any relevant issues at TSMAD meetings;
4. That serious consideration be given to releasing the Hydrographic FDD database, appoint a register manager and start the formal proposal process for new features, attributes and enumerates for S-100 FDD **ASAP**.
5. That a coordinator role be considered within TSMAD to follow up issues between the CSPCWG, TSMAD and CSMWG. If agreed, this role could be raised at CHRIS for support and approval (if required).
6. Once the review of M-4 Part B has been completed, a thorough check be made of all M-4 and INT1 references in S-100/S-101.

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