HSSC5-05.1A

5th HSSC MEETING
Shanghai 5-8 November 2013

Report of the TSMADWG to HSSC 5

Transfer Standard Maintenance and Applications Development Working Group

Submitted by:	Chairman, TSMADWG
Related Documents:	List of Actions HSSC3-05.1C
Related Projects:	NA

Chair:	Barrie Greenslade, UKHO
Vice Chair:	Julia Powell, NOAA
Secretary:	Anthony Pharaoh, IHB
Member States:	Australia, Brazil, Canada, Denmark, Finland, France, Germany, Japan, Republic of Korea, Netherlands, Norway, Republic of South Africa, Russia, Sweden, Turkey, United Kingdom, United States of America.
Expert Contributors:	The International Centre for ENCs (IC-ENC), PRIMAR Stavanger, Caris, ESRI (USA), Furuno (Finland), GEOMOD (France), Jeppesen Marine, IIC Technologies (Canada), IDON Technologies (Canada), SevenCs (Germany), TKartor (Sweden), and Transas (Russia).

1 Meetings Held During Reporting Period

a. TSMAD 25 15 – 18 Jan, 2013, Tokyo, Japan
b. TSMAD 26 10-14 June, 2013, Silver Spring, USA (joint meeting with DIPWG)
c. TSMAD DCEG Sub-WG – 14 January 2013, Tokyo, Japan
d. TSMAD DCEG Sub-WG – 4-6 June 2013, Silver Spring, USA
e. TSMAD Sub-WG - 9-11 Sept 2013 Taunton, UK (S-101 Test Strategy + S-64)

2 Work Program

Progress continues on the work items assigned by HSSC as follows:

2.1 S-100

S-100 Edition 1.00 is currently being used as the basis for several IHO product specifications. This has led to several adjustments being made to various models in order to accommodate the

requirements of these products. Work to develop the content of Part 9 (Portrayal) in conjunction with DIPWG is nearing completion. It is planned to produce a new edition 2.0.0 in 2014.

a. Extensions to the Feature Catalogue Model to accommodate SNPWG requirements

b. Changes to reflect requirements for S-102

c. Addition of a product specification template to help developers of new product specifications.

3 S-101 ENC Product Specification

S-101 is the new Electronic Navigational Chart product specification that is based on S-100. The intent of S-101 is to utilize the flexibility of S-100 to allow the IHO and Member States to respond to the changing needs of the mariner. S-101 will include machine readable feature catalogues and portrayal catalogues that will facilitate updating of changes to shipboard systems.

3.1 S-101 Progress

In order to track the progress of S-101, TSMAD approved the use of a register. The purpose of this risk register is to assess the different pieces that are needed to bring S-101 together. Although, it was originally intended for S-101 to be completed by January 2013 in order to be ready for a thorough test bed process, circumstances that are beyond the scope of TSMAD have necessitated another look at the schedule. As part of this look it is important to identify each piece of the project and assess the risk in order to see if additional resources need to be applied.

This Risk Register is split into three parts:

a. S-100 – Are the S-100 pieces in place to develop a fully mature S-101 product specification
b. S-101 – What pieces need to be in place to complete the S-101 product specification and how are they progressing
c. S-100/S-101 Test Beds – What needs to be done in order to test S-101.

	S-100 Task and Risk Register						
ID	**Task**	**Planned Completion Date**		**% Comp**	**Expected Completion Date**	**Impact**	**Action to Manage Risk**
1.a	S-100 Portrayal Completed (SVG Profile Excluded)	June 2013		98%	October 2013	High	Significant progress was made at meetings in Tokyo and Frankfurt Model is essentially complete with just a few small portions remaining to cleaned-up. DIPWG accepted the model in June 2013 Work on S-52 PresLb4.0 is now winding down and those resources will hopefully be able to devote some time to completing the remaining Section 9 text soon.
1.b	S-100 Portrayal SVG Profile completed	June 2013		5%	December 2013	Medium	An S-100 SVG profile will be created under the Portrayal Catalogue Builder contract, which ends Dec 2013. The profile may be available earlier than Dec.
2	S-100 Portrayal Catalogue Builder completed d) Portrayal register contents are solely based on S-52. e) Register content needs to be validated and any new S-100/101 content added	October 2013			Dec 2013	High	Portrayal Catalogue Builder Contract has been let by the IHO f) It might be possible that all or part of the first S-101 Portrayal Catalogue could be “built by hand” to facilitate starting testbed activities.
3	S-100 Feature Catalogue Builder completed	June 2013		90%	November 2013	High	NOTE: It is currently complete and just needs more testing. Need additional resources to complete it so it can work on the registry server. Issues with TomKat. Contract support from the IHO for IT issues.

	S-101 Product Specification Task and Risk Register						
ID	**Risk**	**Planned Completion Date**		**% Comp**	**Expected Completion Date**	**Impact**	**Risk Mitigation**
1	Main Product Specification complete(Portrayal Excluded)	October 2013		90%	October 2013	High	The main PS is fairly stable and outstanding issues need to be followed up in test beds
2	S-101 Portrayal complete	October 2013		50%	April 2014	High	Until S-100 portrayal is complete, this portion cannot be finalized. As S-52 also feeds into the implementation guidance, this section cannot be completed until S-52 is completed. Portrayal Implementation Guidance Annex – First draft extracted and adapted from S-52. This section will grow throughout testbed phase. Portions of the content may be "promoted" to S-100 or "demoted" to S-101 depending on its degree of applicability to other S-100 based products.
3	S-101 Data Classification and Encoding Guide complete (Baseline)	October 2013		100%	October 2013	High	This version is considered the baseline version for testing.
4	New features and attributes added to the FCD for S-101	November 2013		0%	November 2013	Low	Need to ensure that we have the proper resource to add the new items to the FCD. Although the FC can be created without registering the new features
5	Create a new version of the Feature Catalogue	December 2013		0%	December 2013	High	Need to ensure that we have the proper resource to build the latest version of the feature catalogue

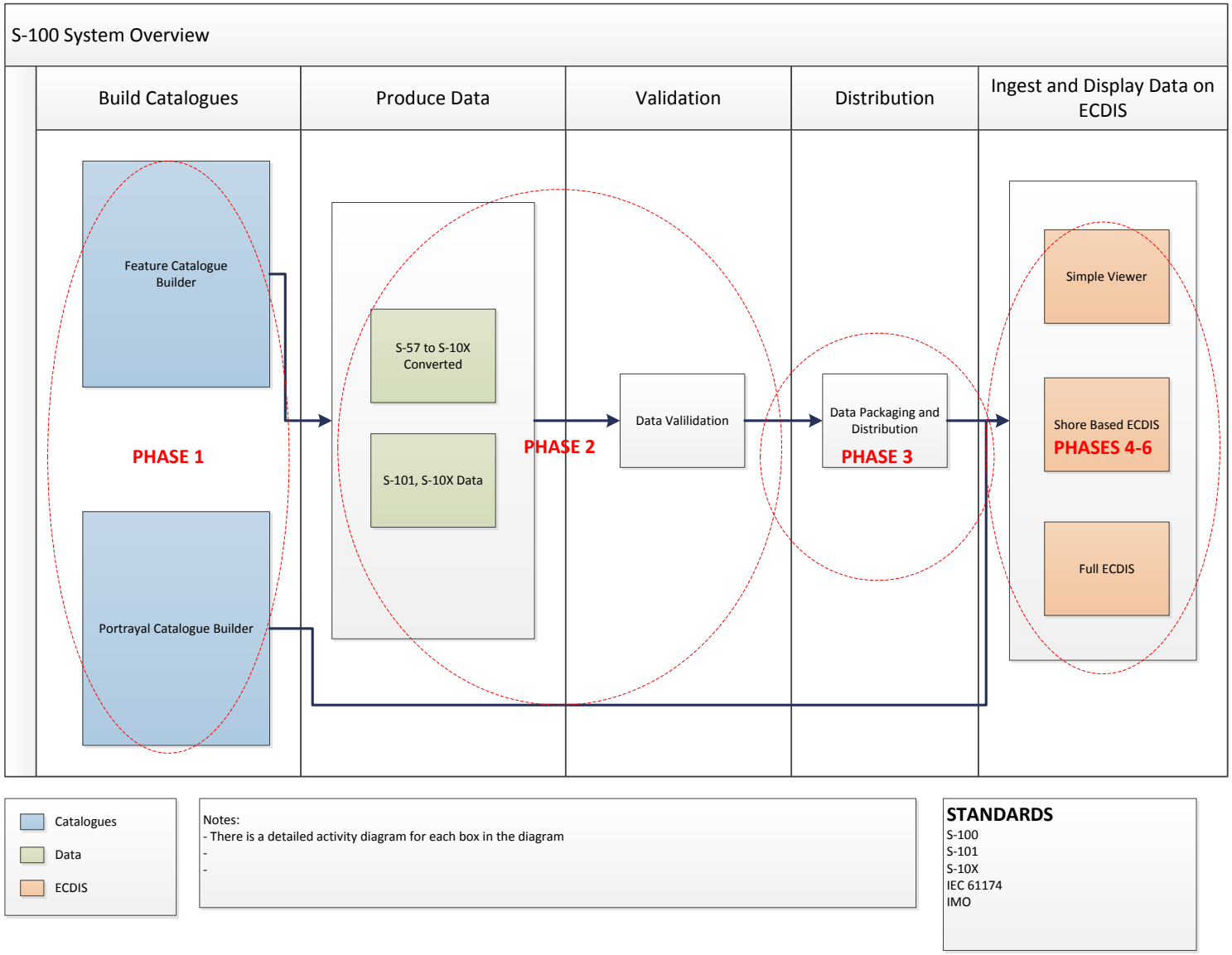
6	Create the first iteration of the Portrayal catalogue	December 2013			December 2013		Develop an "S-52" version of the catalogue that contains the new features. - It might be possible that all or part of the first S-101 Portrayal Catalogue could be "built by hand" to facilitate starting testbed activities Aspects of catalogue that are not built or would depend on CSP logic would display default symbology
7	New CATZOC Model and Portrayal Algorithm	May 2014		50%	May 2014	Medium	DQWG has defined the features. TSMAD to liaise with DQWG to understand when the portrayal algorithm will be completed.
8	S-57 to S-101 Convertor updated to provide test data	January 2014		65%	January 2014	High	Ensure that ESRI will continue to support the Convertor until it is turned over to the IHO. ESRI has self-funded a good portion of the development for the initial phase. It will require some additional funds to complete.
9	S-58 for S-101 Data Validation	October 2014		0%	October 2014	Medium	Create a subset of existing S-58 checks for S-101 and add additional checks based on the new product specification

3.2 S-101 Test beds

Another important element in the development of the S-101 product specification is the requirement for test beds during the development lifecycle and beyond. TSMAD has begun the process of identifying items needed for the test beds and is in the process of developing a high level test strategy document and a test framework. The following is the S-100/S-101 test bed risk register.

	S-100/S-101 Test Bed Risk Register						
ID	**Risk**	**Planned Completion Date**		**% Comp**	**Expected Completion Date**	**Impact**	**Risk Mitigation**
1	S-101 Test Cases completed	October 2013		0%	April 2014	High	IHB to let out a contract to complete this work item. TSMAD acknowledged that this would have to wait until an overarching framework was in place.
2	S-101 Test Plan Strategy	October 2013		95%	October 2013	High	
3	S-101 Test Framework	April 2014		20%	April 2014	High	Hold Test Framework meeting in September 2013
2	S-101 Test Plan Completed	October 2013		50%	April 2014	High	

In September 2013 a small workgroup met to discuss test strategy and framework for an overarching S-100 and S-101 test bed. The beginning point of discussion was the following high level system diagram and splitting out each component into a phase of testing and development.


S-100 System Overview
Build Catalogues
Produce Data
Validation
Distribution
Ingest and Display Data on ECDIS
Feature Catalogue Builder
Portrayal Catalogue Builder
PHASE 1
S-57 to S-10X Converted
S-101, S-10X Data
PHASE 2
Data Valilidation
Data Packaging and Distribution
PHASE 3
Simple Viewer
Shore Based ECDIS
PHASES 4-6
Full ECDIS
Catalogues
Data
ECDIS
Notes:
- There is a detailed activity diagram for each box in the diagram
-
-
STANDARDS
S-100
S-101
S-10X
IEC 61174
IMO

The test bed, when completed will, in effect, be a reference S-100 ECDIS. It will enable TSMAD to test the updateable feature and portrayal catalogues in an environment and a platform that can mimic those systems being submitted for type approval and subsequent use by mariners. In addition, in undergoing a test bed process, S-101 will also be in compliance with TR 02/2007.

3.3 Data Classification and Encoding sub-Working Group

In order to develop the S-101 data model TSMAD22 established the Data Classification and Encoding Guide (DCEG) Sub Group. This group has worked via correspondence and met twice this year.

a. TSMAD DCEG Sub-WG Meeting – 14 January 2013, Tokyo, Japan
b. TSMAD DCEG Sub-WG Meeting – 4-6 June 2013, Silver Spring, USA

A large number of reviews including numerous proposals and hundreds of comments led to a draft DCEG being reviewed by TSMAD prior to TSMAD 26. This will support the completion of a baseline draft of the DCEG to support the testing and development of S-101 to be completed at the end of 2013. This document will continue to evolve and requires user input; the group should be congratulated on its efforts to date.

4 S-57

A new Supplement No. 3 has been produced to strengthen the mandatory role of using S-58 for ENC validation. It also includes some minor changes to remove known inconsistencies. The new supplement will have no effect on the backward compatibility of existing ENCs or ECDIS. A copy of the new supplement accompanies this report.

A new edition 4.0.0 of S-57 Appendix B1, Annex A Use of the Object Catalogue has been prepared. This has been classified as a new edition because it contains an extension providing advice on encoding the NEWOBJ feature for Virtual AIS Aids to Navigation. It also includes a number of Encoding Bulletins released since the last version was published. A copy of the new edition accompanies this report.

5 S-64

A project is in progress to produce a major new version of S-64 to provide an enhanced set of data and accompanying tests for use in the type approval process and the development of ECDIS by OEMs. The new version will provide more explicit tests with accompanying expected output portrayed in a similar way to that used in the IHO Anomalies Test Data. In addition, this edition will also include some chart related tests that were included in IEC 61174.

Currently the completion of S-64 is being delayed by the revision and publication of S-52 Annex A Presentation Library. The main issues are that:

- S-64 requires a stable version of S-52 Annex A in order to finalize the test plots.
- The work is specialised and requires the same stakeholder resource currently being used for the revision of S-52.

If the new version of S-52 Annex A is endorsed by HSSC5 this will free up resources to complete the outstanding work on S-64 by December at TSMAD 27.

5.1 Publication of S-64 Edition 3.0.0

In the future S-64 will perform a greater role in the type approval of ECDIS in conjunction with IEC61174. In order to ensure S-64 is not delayed further HSSC are requested to consider the following recommendations for its publication:

- approve an initial familiarization version by means of a letter to members on completion.
- approve the final version at HSSC 6 and recommend to M.S. for publication in 2015, in line with the publication of the new edition of IEC 61174.

For information an outline version of S-64 e3.0.0 accompanies this report.

6 S-58

A major new edition 5.0.0 of S-58 has been completed a copy of which accompanies this report.
S-58 has been changed to improve the logical ordering of the tests, to provide a more programmatic syntax, and provide encoding advice to fix any error or warning.

7 Generic Template Product Specification for Marine Information Overlays

Work is ongoing. This template is aimed at identifying common elements specifications which are going to be deployed in one common system, for example ECDIS. A clearer indication of what is required will emerge once the S-100 test bed is available.

Two other templates are being developed as aids to developing any S-100 product specification.

- Vector Based Product Specifications: This template is designed for users that wish to develop a vector based product specification. Currently in draft form.
- Gridded Based Product Specifications: This template is designed for users that wish to develop gridded product specifications. Currently being developed by the work item leader of S-102. This fulfils the requirement at A.9 in the work plan.

8 TSMAD Outreach

8.1 IALA

IALA have continued to use S-100 in support of their work on e-Navigation. A workshop on developing S-100 product specifications for e-Navigation was held in June 2013 and was supported by TSMAD members. IALA have produced a guideline on the use of S-100 and also a template for developing product specifications. IALA have identified some areas where S-100 could be improved and extended and these will be considered by TSMAD.

8.2 ISO TC211

Since the last HSSC meeting (25-28 September 2012), the IHO participated in the 36th ISO-Technical Committee 211 (ISO/TC211) plenary and working group meetings which took place in Busan, Korea from the 27th to 31st of May 2013.
The IHO is a class A liaison member of the ISO Technical Committee 211, and has contributed towards the development of the 19100 series of standards and technical specifications. These ISO documents are relevant to the development of IHO standards, have been used for the development of the S-100 Universal Data Model, the IHO GII Registry and S-10X product specifications. Some of the standards development and maintenance activities of relevance to the IHO include the publication of document 19117 – Portrayal. New work items were registered for the development of standards/specifications for; Geodetic References (19161), "Registry service" (19164), "Terminology" (19104), "Place Identifier (PI) architecture - Part 2" (19155-2), "Well known text (WKT) representation of coordinate reference systems" (19162) and "Content components and encoding rules for imagery and gridded data" (19163).
During the meeting, ISO/TC211 also held a "Standards in Action" workshop which focused on "Standardization Activities in Korea" and "Address Data and Standards".
Further information on the activities of ISO/TC 211 and associated publications is available from the ISO/TC211 web site at http://www.isotc211.org/

9 Progress on HSSC Action Items

Agenda Item	Subject	Action No	Actions	
5.1.1	TSMAD Work Plan	HSSC4/07	**TSMAD Chair** to include in the TSMAD work plan an additional work item to produce a roadmap (using mind map), taking into account the S-101 impact study and showing key tasks that have to be completed in order to implement S-100, and indicating interaction between the tasks and the implications for stakeholders.	**Complete**
5.1.4	Identifiers for S-100 based P.S.	HSSC4/11	**TSMAD** to develop, with IHB support and in consultation with the relevant stakeholders, a nomenclature for S-100 based product specifications as part of the GI registry management, and revise S-100, taking into account the following guidance: - S-100 to S-199 should be reserved for IHO product specifications; - Non IHO product	**Complete**

			specifications identifiers should be assigned by the registry manager on a first come first served basis from S-200 onwards.	
5.1.7	S-101 Test Plan Funding	HSSC4/14	**TSMAD** to draft a statement of requirements for the development of S-101 test plan and submit it to the IHB for tendering.	**Complete**
5.1.8	AIS AtoN and ENCs	HSSC4/16	**TSMAD** to develop an Encoding Bulletin that describes	**Complete**
5.3.3	S-100 & S-101 Master Plan	HSSC4/25	**TSMAD and DIPWG Chairs** to produce, by the end of January 2013, a “master plan” document for the development of S-100 and S-101, in accordance with the life cycle diagram included in resolution 2/2007, incorporating sequencing with DQWG and DPSWG, and scheming the implications for stakeholders.	**Complete**
5.1.1	S-64	HSSC3/05	**TSMAD** to investigate expanding S-64 to improve its usefulness for both OEMs and type approval authorities	**In progress**
5.1.3	S-58	HSSC3/06	**TSMAD** to investigate and propose how a minimum validation check standard can be achieved across all ENC providers including the development of a use-case dataset.	**Complete**
5.1.3	S-58	HSSC3/07	**TSMAD** to develop, in consultation with stakeholders, a migration path, guidance and appropriate tools for establishing a minimum check standard.	**In progress**
5.1.5	S-101 Impact Study	HSSC2/07	**TSMAD** to conduct a formal impact study on S-101 in conformance with the requirements of Resolution 2/2007 taking into account paper HSSC INF-4 and report to HSSC4 .	**Complete**

10 Problems Encountered

Although S-100 Part 9 – Portrayal has made good progress recently, the delay has impacted the draft version of S-101 and associated test beds. More recently a change in the planned resourcing of the development of the Feature Catalogue Builder and a draft feature catalogue has also put the start date of testing in jeopardy

Issues with the completion of S-64 were entirely due to the lack of resources with the necessary competence to complete the task. The main problem is that proposals to HSSC for new editions of both S-52 and S-64 did not make clear the scope or resources required to complete the tasks.

11 Recommendations

HSSC is invited to

- approve the continued activity of TSMAD under the work plan at Annex A.
- approve S-57 Appendix B1 Annex A (UoOC) edition 4.0.0.
- approve S-57 Supplement No 3.
- approve the process of endorsement of S-64 as described in clause 5 above.
- approve edition 5.0.0 of S-58.

12 Justification and Impacts

Not applicable.

13 Action Required of HSSC

The HSSC is invited to

- note this report and approve the continuance of TSMAD under the Work Plan at Annex A.
- approve and recommend to M.S the adoption of S-57 Appendix B1 Annex A (UoOC) edition 4.0.0.
- approve and recommend to M.S the adoption of S-57 Supplement No 3.
- approve and recommend to M.S the adoption of S-58 edition 5.0.0.

Anne A - TSMAD Work Plan

TSMAD Tasks

A Maintain S-100 IHO Universal Hydrographic Data Model and related projects:

1. S-99 Operational Procedures for the Organization and Management of the S-100 Geospatial Information Registry
2. S-102 Bathymetric Surface Product Specification

B Maintain S-58 Recommended ENC validation checks (IHO O3.1.1 refers)

C Support FAQ and encoding bulletin sections of IHO web site up to date (IHO O3.1.1 refers)

D Maintain S-64 IHO Test Data Sets for ECDIS

E Maintain S-57 IHO Transfer Standard for Digital Hydrographic Data

F Maintain S-65 ENCs: Production, Maintenance and Distribution Guidance

Task	**Work item**	**Priority** H-high M-medium L-low	**Milestones**	**Start Date**	**End Date**	**Status** P-planned O-ongoing C-completed	**Contact Person(s)**	**Related Pubs/Standard**	**Task**
A	S-100	H	S-100 Published Apr 2010	2001	2010	C	Barrie Greenslade (UKHO)		
A.1	Develop a template Product Specification for Marine Information Overlays (MIO)	M		2010		O	Barrie Greenslade (UKHO)		
A.2	Develop S-101 ENC product specification	M		2006	2014	O	Julia Powell (NOAA)		
A.3	Conduct an S-101 Impact Study	H		2012	2012	C	Laurent Louvart (SHOM)		
A.4	Investigate a suitable grid referencing system for S-100	L		2010		O	Tony Pharaoh (IHB)		

Task	Work item	Priority H-high M-medium L-low	Milestones	Start Date	End Date	Status P-planned O-ongoing C-completed	Contact Person(s)	Related Pubs/Standard	Task
A.5	Investigate expanding S-64 to improve its usefulness for both OEMs and type approval authorities	M		2012	2013	O	Tom Richardson (UKHO)		
A.6	1. Restructure S-58 to provide a more logical means of data validation. 2. Investigate how the new version of S-58 can be used to implement a minimum validation standard for all ENCs.	M		2012	2013	C	Richard Fowle(UKHO) Tom Richardson (UKHO)		
A.7	Develop S-100 Bathymetric Content Specification.	H	S-102 Published April 2012	2001	2012	C	Wade Ladner (NAVO)		
A.8	Develop S-100 Portrayal Component	H		2006		O	DIPWG		
A.9	Develop an S-10X product specification for Auxiliary Informational Layer Integration.	M	1st Draft 2010	2010		C	Lynn Patterson (CHS)		
A.10	Liaise with Non-IHO Constituents, e.g. Inland ECDIS, Marine Navigation Industry, DGIWG, AML, WMO Ice, and GIS Industry.	H		2004	-	O			
A.11	Study the possibility to encode information features as New Objects (see S-57 supplement) to avoid caution area objects (CNTARE) in some cases, e.g. to encode T&Ps"	M				O			

Task	Work item	Priority H-high M-medium L-low	Milestones	Start Date	End Date	Status P-planned O-ongoing C-completed	Contact Person(s)	Related Pubs/Standard	Task
B.1	Keep S-58 Recommended Validation Checks up to date	H		2003	-	O	Richard Fowle (UKHO)		
C.1	Support FAQ and Encoding Bulletins	H		2003	-	O	Jeff Wooton (AHS)		

TSMAD Meetings

TSMAD

Date	Location	Activity
29 Sep – 3 Oct 03	Wollongong, Australia	10th Meeting
11-12 November 04	IHB, Monaco	11th Meeting
10-11 November 05	Wollongong, Australia	12th Meeting
18-22 September 06	Wellington, New Zealand	13th Meeting
4-8 June 07	UKHO, Taunton	14th Meeting
14-18 January 08	IHB, Monaco	15th Meeting
5-9 May 08	Cape Town, South Africa	16th Meeting
8-12 September 08	Seattle, USA	17th Meeting
4-8 May 09	Ottawa, Canada	18th Meeting
26-30 Oct 09	Sydney, Australia	19th Meeting
3-7 May 10	Rostock, Germany	20th Meeting

29 Nov-3 Dec 10	Victoria, Canada	21st Meeting
16-20 Jan 12	Wellington, New Zealand	22rd Meeting
7-11 May	Monaco	23rd Meeting
15-18 Jan	Tokyo	25th Meeting
10-14 June	Silver Spring	26th Meeting

TSMAD S-100 Sub-WG

Date	**Location**	**Activity**
25-29 April 05	Univ. of NH, USA	1st Meeting
7-9 November 05	Wollongong, Australia	2nd Meeting
15-19 May 06	Brest, France	3rd Meeting
18-22 September 06	Wellington, New Zealand	4th Meeting
27-1 December 06	Silver Spring, USA	5th Meeting
23-27 April 07	Ottawa, Canada	6th Meeting
17-21 September 07	Hamburg, Germany	7th Meeting
2-4 September	Taunton, UK	8th Meeting

Annex A

M-3 TR K2.21

TRANSFER STANDARD MAINTENANCE AND APPLICATIONS DEVELOMENT W.G. (TSMAD) – Terms of Reference

1. Objective

a) To maintain, develop and extend:

(i) the S-57 IHO transfer standard for digital hydrographic data;
(ii) the S-100 IHO Geospatial Standard for Hydrographic Data;
(iii) the S-101 IHO ENC Product Specification;

b) To monitor the development of other related international standards.

2. Authority

This WG is a subsidiary of the **Hydrographic Services And Standards Committee (HSSC)**. Its work is subject to HSSC approval.

3. Procedures

a) The WG should:

(i) maintain the S-57 IHO transfer standard for digital hydrographic data by preparing and promulgating maintenance documents containing clarifications, corrections and extensions when required;

(ii) maintain the S-100 IHO Geospatial Standard for Hydrographic Data as directed in Part 13 (S-100 Maintenance Procedures)

(iii) maintain the S-100 IHO ENC Product Specification as directed in …..

(iv) review relevant international standards and specifications and advise HSSC accordingly;

(v) consider new topics as instructed by HSSC and advise HSSC accordingly and/or draft the relevant extension documents;

(vi) draft new editions of the IHO transfer standard for digital hydrographic data as instructed by HSSC.

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 HSSC WG's, international organizations and industry to educate and encourage the application of IHO standards to the work of those organizations.

d) The WG should identify and promote the availability of other navigation-related data in ECDIS and in IHO geospatial standard-compliant format

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e) 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.

g) The Chair and Vice-Chair shall be a representative of a Member State. The election of the Chair and Vice-Chair shall be decided at the first meeting after each ordinary session of the Conference (Conference to be replaced by Assembly when the revised IHO Convention enters force) and shall be determined by vote of the Member States present and voting.

h) If the Chair is unable to carry out the duties of the office, the Vice-Chair shall act as the Chair with the same powers and duties.

i) Expert Contributors shall seek approval of membership from the Chairman.

j) 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.

k) All members shall inform the Chairman in advance of their intention to attend meetings of the WG.

l) 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.