HSSC4-05.1A rev1

4th IHO-HSSC Meeting
Taunton, UK, 25-28 September 2012

Report of the TSMADWG to HSSC 4

Transfer Standard Maintenance and Application 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, 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 23 16 – 20 Jan, 2012, Wellington, New Zealand
b. TSMAD 24 7-11 May, 2012, Monaco (joint meeting with DIPWG)
c. TSMAD DCEG Sub-WG Meeting – 11-13 January 2012, Wollongong, Australia
d. TSMAD DCEG Sub-WG Meeting – 2-4 May 2012, Monaco

2 Election of officers

As dictated by the TSMAD terms of reference, a post IHC election of officers took place at TSMAD 24 in Monaco. There was one candidate proposed for each post, all of which were elected unopposed as follows:

Chair – Barrie Greenslade UKHO
Vice Chair – Julia Powell NOAA
Secretary – Anthony Pharaoh IHB

3 Work Program

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

3.1 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 continues to develop the content of Part 9 (Portrayal) in conjunction with DIPWG. It is planned to produce a new edition 2.0.0 in 2013.

4 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.

4.1 S-101 Progress

S-101 is taking an iterative approach and is broken out into four phases. The phases are as follows:

Phase 1: S-57 content equivalent. It will contain only those features that are currently defined in S-57, but use complex attributes, information types and compound geometry.

This phase was completed in December 2010 and has provided the baseline for the S-57 to S-101 open source convertor.

Phase 2: Enhanced Packaging and Data Loading Mechanisms. This phase builds on phase 1, yet adds in functionality for new support file formats and functionality to update text files. In this phase the entire set is packaged into a complete exchange set.

This phase was completed in December 2011.

Phase 3: Extending the Model. This phase builds on the previous phases and extends the data model to include additional complex attributes and information types. In addition, this phase will explore the use of cartographic attributes.

This phase was completed in May 2012

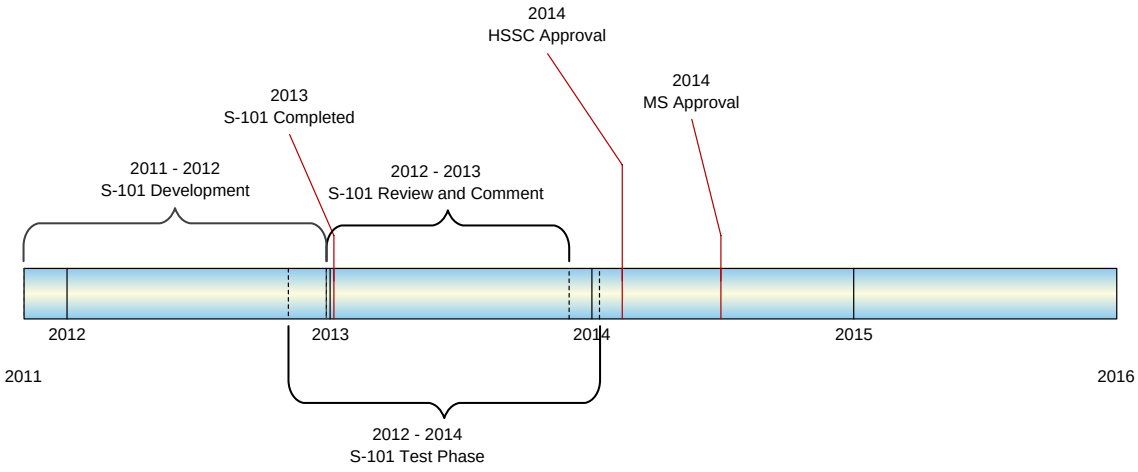
Phase 4: Scalability. This phase represents Version 1.0 of S-101. By the completion of this phase the open source translator must be able to take an existing S-57 dataset and

translate it into an S-101 dataset. TSMAD will provide the final S-57 to S-101 Feature Catalogue mapping.

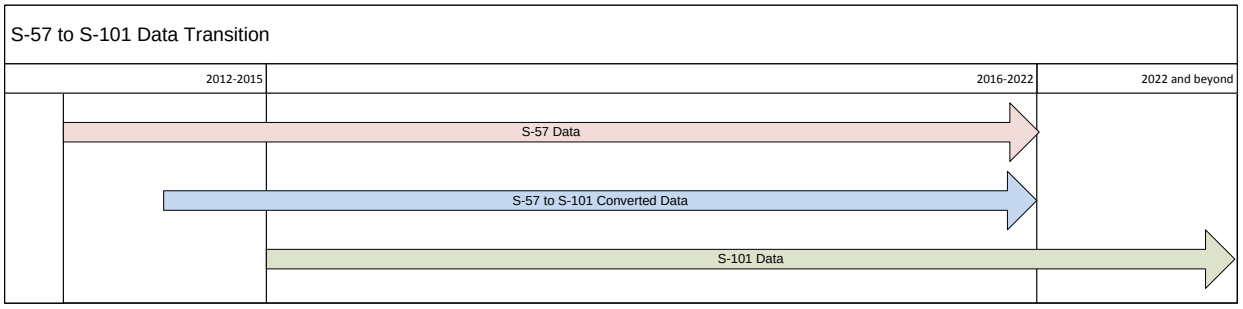
This is the final phase of S-101 and had an original planned completion date of December 2012. However, as one of the major components of S-101 includes portrayal, this phase cannot be completed until DIPWG agrees upon an S-100 portrayal model, which can then be used to develop S-101 portrayal.

Aside, from the lack of portrayal, TSMAD has made significant progress on the other aspects of S-101, including the building of an S-101 feature catalogue, establishing a methodology for cartographic representation, improving the exchange set metadata and better support file management.

The following timeline, represents a notational schedule for the S-101 approval process. It should be noted that if portrayal is not completed within 2012, then the schedule will slide to the right.



Once S-101 is approved, MS will also need to consider a transition period. The following timeline provides an initial estimate of the minimum timescale for the data transition from S-57 and S-101. For a period of time, both S-57 and S-101 will coexist, until such time as IHO, in consultation with the ENC stakeholder community, determines that S-57 ENCs are no longer valid or required.



Dates are only notational

Dates and timescale yet to be considered by IHO

4.2 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. The main items are as follows:

- S-57 to S-101 open-source convertor
- S-101 open source data editor
- S-101 open source data viewer
- S-100/101 ECDIS reference Test Bed

TSMAD has also recognized the need for an S-101 data editor and an S-101 viewer to enable the creation of S-101 data from first principles. This is required to enable testing and validation of the functionality of the exchangeable feature and portrayal catalogues and the creation of test data that supports new S-101 functionality.

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.

4.3 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 has met twice as follows;

11th – 13th January 2012 Wollongong, Australia
2nd – 4th May 2012 IHB, Monaco

The group has made good progress and has developed a number of proposals for new features and attributes to improve the usability of S-101 ENC. 800 comments were reviewed during phase 2 and a further review phase will begin shortly to enable a draft to be submitted to TSMAD25 for review.

5 S-102 Bathymetric Surface Product Specification

S-102 ed 1.0.0 was published April 2012. TSMAD is currently preparing the next edition of S-102 to address additional comments that came in post approval.

6 S-57

A new version of S-57 Appendix B1, Annex A Use of the Object Catalogue has been prepared to include a number of Encoding Bulletins released since the last version was published (available for download at *www.iho.int/iho_pubs/IHO_Download.htm#Draft_UOC*).

7 S-64

A project is in progress to produce a 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.

8 S-58

A project is in place to produce a minor update to S-58 to reflect the changes that were made in the last edition of the Use of the Object Catalogue. In addition, work is progressing on restructuring and improving the language of the tests to remove any ambiguities. As part of this work item a number of datasets are being produced of which the United States (NOAA) funded the encoding of 348 of the possible 425 checks. The purpose of this dataset is to provide negative checks that can be used in software testing and validation by both production software and Hydrographic offices.

9 Generic Template Product Specification for Marine Information Overlays

Work is ongoing. An example generic product specification has been developed to assist those organizations adopting S-100.

10 TSMAD Outreach

10.1 IALA

The IHB hosted a IALA e-Navigation workshop during February 2012 which was supported by members of TSMAD. This meeting explored IALAs use of the GI Registry and developed a draft guideline. A number of draft product specifications were discussed to assist IALA in the use and application of S-100.

Following the workshop TSMAD has assisted IALA to produce a draft guide to developing product specifications which will be submitted to IALA e-Nav and could be developed further by TSMAD. Such resources will support the wider use of S-100 by a range of organisations without reliance on TSMAD.

10.2 EU BLAST Project

Tom Richardson (UK) presented on S-100 at the BLAST (Bringing Land and Sea Together) Conference in Oostende Belgium during September 2011. This included a useful discussion on the interrelation of S-100 and INSPIRE.

10.3 Singapore E-Navigation Workshop

Tom Richardson (UK) presented on S-100 at a workshop in Singapore hosted by the Norwegian Coastal Administration assisted by MPA Singapore and the MEH project. The workshop included an S-100 test bed demonstration and discussed how S-100 fits within e-navigation and how it can be further developed.

10.4 ISO TC211

The ISO 19100 standards have been used as the base standards for the development of the S-100 Universal Data Model and the IHO GII Registry, and are relevant to the continued standards development work of the TSMADWG and other HSSC Working Groups developing S-100 based product specifications. In 2012 a Memorandum of Understanding (MoU) was signed between the IHO and the ISO. The MoU is intended to strengthen cooperation between the two organizations and harmonize their work activities in order to achieve mutual benefit by sharing resources.

Since the HSSC 3 meeting (8-10 November), the ISO/TC211 held working group and plenary meetings in Centurion, South Africa (December 2011) and Toulouse, France (June 2012).

The following ISO/TC211 standards / technical specifications are presently undergoing systematic reviews:

19103:2005 - Conceptual Schema Language;
19119:2005 – Services,
19117:2005 – Portrayal;
19139 (2) - Metadata - XML Schema Implementation - Part 2 Extensions for imagery and gridded data;
19110:2005 - Methodology for feature cataloguing;
19115-1 Metadata - Part 1 Fundamentals;
19109 - Rules for application schema;
19135-1 - Procedures for item registration - Part 1;
19135-2 Geographic information - Procedures for item registration - Part 2 XML Schema Implementation;
19157 - Data Quality
19158 - Quality assurance of data supply.

The following new documents were approved for publication:

DTS 19150-1 Ontology Part 1 Framework;
DTS 19139-2 Metadata XML Schema Implementation - Part 2 Extensions for imagery and gridded data;
DTS 19130-2 Imagery sensor models for geopositioning - Part 2.

The following new projects were registered by the Technical Committee:

NP 19136-2 - Geography Markup Language (GML) Part 2 Extended schemas and encoding rules;

NP 19115-3 Metadata Part 3: XML schema implementation of metadata fundamentals

NP 19160-1 Addressing Part 1 Conceptual model.

The committee also established an ontology maintenance group to ensure that the ontologies used in ISO/TC 211 projects are maintained and made accessible.

The next ISO/TC211 meeting is scheduled to take place in Jeddah, Saudi Arabia in December 2012.

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 for many years. These standards are relevant to the work of TSMAD as they have been used as the base standards for the development of the S-100 Universal Data Model, the IHO GII Registry and S-10X product specifications.

Since the last HSSC meeting (26-29 October 2010), the IHO participated in the 32nd ISO/TC211 meeting which was held in Delft, The Netherlands between the 23rd and 27th of May 2011.

Some of the standards (of relevance to TSMAD and DIPWG), that are currently being developed or revised include; Portrayal services (19117-2), Portrayal finishing rules (19117-3), Catalogue services, metadata (19115), metadata - XML schema implementation (19139), and Spatial schemas (19107). Further information on the development activities of ISO/TC 211 is available from the ISO/TC211 web site at; http://www.isotc211.org/

ISO/TC211 also presents a "Standards in Action" workshop during its meetings. At the 32nd TC211 meeting (Delft, Netherlands) several presentations were provide describing how the19100 standards are being used thorough the world. These presentations are available for download from the standards in action web page; (http://www.nen.nl/web/Evenementen/Evenementenkalender/Workshop-Standards-in-Action.htm).

4 Progress on HSSC Action Items

Agenda Item	Subject	Action No	Actions	
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.	**In progress**

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 .	**In progress**

5 Problems Encountered

Lack of progress with S-100 Part 9 – Portrayal, which will probably delay the draft version of S-101 and associated test beds.

6 Recommendations

HSSC is invited to

approve the continued activity of the TSMADWG work plan.
endorse S-57 Appendix B1 Annex A(UOC) edition 3.1.0 and to recommend its adoption by Member States.

7 Justification and Impacts

Not applicable.

8 Action Required of HSSC

The HSSC is invited to

- note this report and approve the continuance of the Work Plan.
- **endorse** S-57 Appendix B1 Annex A (UOC) edition 3.1.0.
- **recommend** to MS that S-57 Appendix B1 Annex A (UOC) edition 3.1.0 be adopted forthwith to replace the existing edition 3.0.0 dated January 2011.

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	Jan 2012 ?	O ?	Julia Powell (NOAA)		
A.3	Conduct an S-101 Impact Study	H		2012	2012	O	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	O	Guy Uguen (SHOM) 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		O	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	Guy Uguen (SHOM)		
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	23rd Meeting
7-11 May	Monaco	24th 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

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. When meetings are scheduled, and in order to allow any WG submissions and reports to be submitted to HSSC on time, WG meetings should not normally occur later than nine weeks before a meeting of the HSSC.

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

-

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.

d) 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.

e) 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.

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.