CHRIS20-06.1A rev.1

20th CHRIS MEETING
Niterói, Brazil 3-7 November 2008

Report of the TSMADWG to CHRIS 20

Transfer Standard Maintenance and Application Development Working Group

Submitted by:	Chairman, TSMADWG
Related Documents:	List of Actions from CHRIS19
Related Projects:	NA

Chair:	Barrie Greenslade, UK
Vice Chair:	Don Vachon, Canada
Secretary:	Anthony Pharaoh, IHB
Member States:	Australia, Belgium, Canada, Denmark, Estonia, Finland, France, Germany, Italy, Japan, Republic of Korea, Netherlands, New Zealand, Norway, Republic of South Africa, Singapore, Spain, Sweden, United Kingdom, United States of America and Venezuela.
Expert Contributors:	The International Centre for ENCs (IC-ENC), PRIMAR Stavanger, Caris (Canada and Netherlands), ESRI (USA), Furuno (Finland), GEOMOD (France), Jeppesen, HAS Systems (Australia), IDON Technologies (Canada), IIC Technologies (Canada), Joint Geospatial Support Facility (New Zealand), MITRE (USA), SevenCs (Germany), TKartor (Sweden), and Transas (Russia).

Meetings Held During Reporting Period

1. TSMAD 15 14-18 January, 2008, Monaco
2. ECDIS S-101 Stakeholder Workshop 3-7 March, 2008, Monaco
3. TSMAD 16, 5-9 May, 2008, Cape Town, South Africa (including joint meeting with CSMWG)
4. TSMAD-MEPTG, 3-5 June, 2008, San Francisco, CA USA
5. TSMAD 17, 8-12 September, 2008, Seattle, US

Work Program

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

S-100

A draft version was published in March 2008 following TSMAD 15. Comments were invited from peer groups and stakeholders and these were reviewed at TSMAD 17 and S-100 edited as necessary. A new version of an ISO/IEC 8211 encoding schema is nearing completion. TSMAD can be regarded as leading experts on this standard and it is the intention to review this internally, with the assistance of interested OEMs. The encoding will be added to S-100 in early 2009 in plenty of time for the proposed publication date.

Recommendations for the publication of S-100 are submitted to CHRIS 20 (CHRIS20-06.1E).

The proposed IHO Geospatial Information Infrastructure for S-100 was also discussed at TSMAD 17. Whilst there was approval of the overall structure and governance arrangements, there were concerns raised over the scope and definition of the separation between hydrographic (SOLAS), hydrographic related and other domains. The Marine Environment Protection Product Specification exercise highlighted the difficulties there could be in delineating between domains particularly those of hydrographic related and other.

I would also like to take this opportunity to thank everyone involved in the development of S-100 for their contribution and perseverance.

S-101 ENC Product Specification

A ECDIS Stakeholder Workshop held in March was highly successful and provided a wealth of information which has been carried forward into the development of S-101.

One item of note which was initially discussed at TSMAD 16 and continued at TSMAD 17, was the concept of a global small scale ENC product as described in this extract from the TSMAD 16 minutes:

The allocation of cell to the Small Scale usage bands (1 and 2). It was proposed that there should be a single very small scale global ENC product. This could for example be produced under the auspices of the IHO to ensure consistency, and could possible be based on a world grid layout.

This in fact aligns with recommendations of BSEHWG report regarding consistent use of scales, but on a global basis. As TSMAD chair I was requested by the membership to propose this concept to the CHRIS for discussion and guidance on whether to progress this further.

A new wiki/forum has been set up using Google Groups and is intended to be the main working environment for S-101 between meetings.

A working draft version of S-101 is now due May 2009 and it may be appropriate to convene another Stakeholder Workshop, either during CHRIS 21 (HSSC 1) or as a separate meeting.

S-10X Hydrographic Survey Product Specifications

Initial scoping complete. It is planned to have at least two P.S. for both processed and unprocessed survey information. The processed version (S-102) will be based on the Bathymetric Attributed Grid (BAG), of which the content, structure and format will remain unchanged, but the layout will be reformatted in a S-100 style. An early working draft version of S-102 is almost complete and will be posted on a new branch of the S-100 wiki for open discussion shortly.

S-10x Digital Paper Chart Product Specification

Work stalled through loss of 3rd work item leader and lack of resources. Is there still a use case for this work?

Marine Environment Protection Product Specification (MEPPS)

As required by CHRIS 19, TSMAD formed a Task Group to progress the development of a MEPPS. The inaugural meeting of the MEPPS Task Group was held in June 2008, the report of this meeting to TSMAD is at Annex A. The report was discussed at TSMAD 19 and whilst further investigation will be required on the register placement of the proposed features and attributes, approved the following recommendations to CHRIS 20:

1. Propose the MPAARE (Marine Protected Area) feature for inclusion in the hydrographic feature data dictionary.
2. Refer the information types, MPADET (Marine Protected Area Details) and MPAPEN (Marine Protected Area Penalty) to the SNPWG for adoption to the nautical publications feature data dictionary.
   Refer the feature attributes, CATMPA (Category of MPA) and CATIUC (IUCN Category) to the SNPWG for adoption to the nautical publications feature data dictionary.
3. Recommend that the CHRIS authorize continued work by this task group to develop a marine environmental protection product specification based on the above features and attributes.
4. Continue to investigate, and make a complete assessment, of coral reef ecosystems and how they could be integrated in a marine information overlay. This would also include ensuring that internationally agreed classification of the domain is achievable.

Progress on CHRIS Action Items

No outstanding actions.

Problems Encountered

ISO 19117 (Portrayal) continues to be an issue for S-100. Progress on its revision has been slow, but the recent addition to the ISO working group of Holger Bothien (7Cs), through a IHB/CSMWG contract, has both accelerated progress and ensured compliance with S-100 requirements. A review of the final working draft will take place in January 2009 and it is anticipated that it will move to Draft International Standard in May 2009. This would be the earliest date when the standard would be stable enough to include in S-100.

Many other ISO 19100 series standards are reaching their 5 year review date and IHO must continue their involvement in the TC 211 work to ensure backward compatibility with S-100. The S-100 maintenance/versioning mechanism facilitates change without compromising published product specifications, but careful management of the any changes introduced because of changes to the ISO standards must be managed carefully in order to maintain interoperability.

Any Other Items of Note

The joint TSMAD/CSMWG meeting in Cape Town was an unqualified success. S-101 was the main agenda item and the presence of numerous industry stakeholders enabled constructive debate.

At TSMAD 16 there was a brief debate on the subject of whether the title of the working group should be changed with the move to the new HSSC structure. It was agreed that TSMAD is a well known “brand name” and it would be counter productive to make any change at this time.

Meeting minutes and documentation are posted on the IHO Web site.

Conclusions and Recommended Actions

CHRIS 20 is invited to endorse the continued activity of TSMADWG and in particular the recommendations for the continuance of MEPPS task group.

Justification and Impacts

Not applicable.

Action Required of CHRIS

The CHRIS is invited to note this report and endorse the continuance of the Work Plan.

TSMAD Work Plan

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 Marine Environment Protection Programme based on S-100

Task	Work item	Priority*	Milestones	Start Date	End Date	Status **	Contact Person(s)	Affected Pubs/Standard	Remarks
A	S-100	H	Draft Version published March 2008, S-100 Editing Committee Meeting Sept 2008	2001	2009	O	Barrie greenslade		
A.1a	Develop S-100 Feature Dictionary component	H		2001	Feb 06	C	Holger Bothien		
A.1b	Develop S-100 Feature Catalogue component	H		2007	Dec 07	C	Holger Bothien		
A.2	Develop S-101 ENC product specification	M		2006	Jan 12	O	Julia Powell, Richard Fowle		
A.3	Develop S-100 Imagery and Gridded Data component	H		2001	Feb.06	C	Don Vachon		
A.4	Develop S-100 Time varying and 3-D data. component	H		2001	Oct.04		Jim Radice		Deleted, absorbed into other work items.
A.5a	Develop S-100 metadata component	H		2001	Dec 07	C	Tony Pharaoh		

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

Task	Work item	Priority*	Milestones	Start Date	End Date	Status **	Contact Person(s)	Affected Pubs/Standard	Remarks
A.5b	Develop S-100 quality metadata component	H		2007	Jan 08	C	Dion Gaulton		
A.6a	Develop Application Schema component	H		2001	Jan 08	C	Barrie Greenslade		
A 6b	Develop S-100 Framework Document	H		2006	Dec 07	C	Barrie Greenslade		
A 6c	Develop S-100 Spatial Component	H		2003	Sep 06	C	Barrie Greenslade		
A 6d	Develop S-100 Encoding Component	H				O	Barrie Greenslade		
A.7	Develop S-100 Bathymetric Content Specification.	H		2001		O	Wade Ladner		
A.8	Develop S-100 Portrayal Component	H		2006		O	CSMWG		
A.9	Develop S-57 to paper chart functionality and Print-on-Demand (POD) file transfer guidelines.	M		2003		P	No current work item leader		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			
B.1	Keep S-58 Recommended Validation Checks up to date	H		2003	-	O	Guy Uguen		
C.1	Support FAQ and Encoding Bulletins	H		2003	-	O	Jeff Wooton		
D	Develop Marine Environment Protection Programme based on S-100	M		2008	2009	O			

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

TSMAD S-100 Sub-WG

Date	Location	Activity
25-29 April 05	Univ. of NH, USA	8th Meeting
7-9 November 05	Wollongong, Australia	9th Meeting
15-19 May 06	Brest, France	10th Meeting
18-22 September 06	Wellington, New Zealand	11th Meeting
27-1 December 06	Silver Spring, USA	12th Meeting
23-27 April 07	Ottawa, Canada	13th Meeting
17-21 September 07	Hamburg, Germany	14th Meeting

Annex A

TSMAD17-5.1

17th TSMADWG MEETING

Report of the MEPTG

MARINE ENVIRONMENTAL PROTECTION PRODUCT SPECIFICATION TASK GROUP

Submitted by:	Work Item Leader, MEPTG
Related Documents:	CHRIS19-08.1B: Marine Environmental Protection Product Specification
Related Projects:	NA

Work Item Leader:	Craig Winn, US
Member States:	Australia, Brazil, Canada, Germany, Japan, Republic of Korea, Mexico, Singapore, Republic of South Africa, United Kingdom, United States of America
Expert Contributors:	IUCN, UNEP, Parks Canada, Mesoamerican Barrier Reef System, Brazil Ministry of Environment, CARIS, JEPPESEN, ESRI, ICAN, IIC Technologies, NOAA

Meetings Held During Reporting Period

MEPTG, 3 - 5 June, 2008, San Francisco, CA USA

Progress on TSMAD Action Items

The Marine Environmental Protection Product Specification Task Group (MEPTG) was established to develop an S-100 Product Specification (PS) for environmental data, specifically environmental data related to marine protected areas (MPA) and coral reef ecosystems. As directed by the CHRIS, the original expectation was that this PS would allow the integration of coral, MPAs and other marine environmental information for use with Electronic Navigational Charts (ENCs) in an Electronic Chart Display and Information System (ECDIS). This PS would also permit the exchange of MEP information among scientists and environmental mangers in a standardized format for non-navigation purposes. Discussions and decisions derived by consensus of the Task Group participants resulted in a different set of outcomes.

In order to accomplish the assigned task, participation of subject matter experts from the international environmental community was essential. This participation was consistent with the expanded vision and mission of the IHO to provide hydrographic data for the widest possible uses, including for protection of the marine environment. The workshop provided an opportunity to build necessary relationships with environmental content area specialists that were necessary for this specific task and will quite likely prove beneficial in any future IHO sanctioned MEP endeavors.

Local representatives of maritime industry also joined the first day of the meeting to provide the task group with a user's perspective. These representatives confirmed that positional and restriction information particularly for Marine Protected Areas was of great interest due to the associated penalties and that such information should be included in ENCs if possible. They were also clear that supplementary information about MPAs was unnecessary for safe navigation.

The MEPTG determined that MPA information should be structured for use by SOLAS class vessels. The first question addressed by the task group was, with the SOLAS class user in mind, where should information about MPAs reside within the S-100 structure? The consensus of the task group was that positional and restriction information related to MPAs should reside in the hydrographic feature data dictionary because many MPAs have entry and transit restrictions that should be available to the professional mariner as part of the (ENC). Therefore, the task group decided to propose a new feature, MPAARE to the hydrographic register.

The second question addressed by the task group was, how much information should the professional mariner have about the MPA management objectives, MPA classification, and specific penalties associated with a marine protected area? Access to this information may prove valuable in certain cases, such as reporting oil spills or hazardous material discharges, but most professional mariners may not need this level of detail. The task group decided that this information is supplementary and could be made non-mandatory. Detailed information about MPAs may be more appropriate for other product specifications; therefore the task group decided to propose that two new information type objects, MPADET and MPAPEN be forwarded to SNPWG for inclusion in the Nautical Publications register.

Problems Encountered

Several factors prevented the task group from completing the MEP product specification. First, due to the aggressive timeline established for this process only one meeting was held. This meeting provided an essential opportunity to bring together the necessary expertise from the international hydrographic and environmental communities. Since such interaction is rather new for IHO technical bodies, each group needed some familiarization with concepts outside of their respective areas of expertise; therefore the first day of the workshop consisted of background presentations about the IHO, S-100, MPAs, and coral reef ecosystems. This educational session was necessary so that all participants could begin discussions with a common frame of reference. The remainder of

the workshop was devoted to addressing how to include MPAs within S-100, including the development of the MPAARE feature object and attributes. Time constraints prevented a complete assessment of coral reef ecosystems.

Secondly, a resolution on how to handle marine environmental protection data that is not navigationally significant was not achieved, because of inconvenient timing with S-100 development. S-100 is currently being drafted; therefore many of the processes inherent to S-100 have not been tested. Environmental and scientific information that is both supplementary and complementary to the ENC needs a place to reside within the S-100 structure. A possible solution to this problem would be to register new environmental features and attributes that are not navigationally significant in a separate register. However, due to the draft status of S-100, the process for establishing such a register is not clearly defined. Continued work in this area is necessary to clarify the register creation process.

Lastly, the complexity of coral reef ecosystems, lack of an internationally accepted classification scheme, and their debatable importance to commercial navigation precluded the Task Group from making any decisions on how to incorporate this information into S-100, and ultimately deliver this information to scientists and mariners in a clear and useful manner at this time. The task group approached coral reef ecosystems from the standpoint of the professional mariner. Modeling these ecosystems for users other than navigational interests was not seriously undertaken. A continuation of the MEP task group may allow for a complete assessment of how to handle coral reef ecosystems.

Conclusions and Recommended Actions

Conclusions

- The MEP Task Group established to develop a marine environmental protection product specification centered on two concepts or features, one of these proving to be navigationally significant. A separate register should be created to house environmental and scientific information that is supplementary to the ENC. Once the register is populated with appropriate features, or other features that have been deemed not appropriate for navigationally centered registers, a product specification using these features can be developed.

- There is concern within the navigational community about the impact that a marine environmental protection product specification would have on navigational users. A clear cut distinction between navigational use, and support of other users should be made at the outset of any future MEP endeavors. This distinction will eliminate resistance to future product specifications aimed at users other than traditional navigational interests.

- The theoretical register structure seems clear. Implementation of this structure as it relates to new topics, such as environmental and scientific information, is

ambiguous. Mechanisms for creating a new register, designating a register owner, and utilizing features and attributes from other registers in a product specification do not seem to be clearly understood by individuals outside of primary working groups responsible for S-100 development. Clarification of these issues needs to be undertaken.

- The work of this task group helped to build partnerships between hydrographic offices and environmental organizations. These partnerships should be fostered through continued communication, so that environmental and scientific organizations gain an understanding of the IHO's goals and mission. Educating external users on how the IHO S-100 data transfer standard can be used for exchange and use of hydrographic data for non-navigation purposes will reinforce the role of IHO in supporting marine environmental protection. However, roles and responsibilities of how hydrographically related registers are sponsored, maintained and utilized are not clear.

Recommended Actions

- Adopt MPAARE feature into the hydrographic feature data dictionary. Refer to the included appendices for the specific modeling of this feature.

- Refer the information type objects, MPADET and MPAPEN to the SNPWG for adoption to the nautical publications feature data dictionary.

- Refer the feature object attributes, CATMPA and CATIUC to the SNPWG for adoption to the nautical publications feature data dictionary.

- Recommend that the CHRIS authorize continued work by this task group to develop a marine environmental protection product specification that could demonstrate how the S-100 standard can be used by scientists, environmental stewards, and natural resource managers to reliably exchange and use hydrographic data for non-navigation purposes.

Justifications and Impacts

Adopting these new features and associated attributes would have minimal negative impacts for the navigational community, and would benefit the environment, enhance safe navigation, and demonstrate the IHO's commitment to safe navigation and environmental stewardship.

MPAs are currently modeled within S-57 as restricted areas (RESARE) with an environmental enumeration in the category of restricted area (CATREA) attribute. Adopting the proposed features and attributes as recommended, modernizes the modeling of MPAs for future ENCs and other product specifications. This action demonstrates the

flexibility inherent in S-100 to adapt features and attributes to changing conditions within the environmental and scientific community.

Continued work on a Marine Environmental Protection Product Specification will offer several benefits to the IHO's development of S-100. These benefits include the following:

- provide an opportunity to test S-100 structure and processes, such as new register creation and management
- develop a mechanism within S-100 structure to handle and address information that is not strictly for navigation
- demonstrate the IHO's commitment to developing a flexible standard for hydrographic data, as well as data allied with navigation, such as emission control areas and information related to MARPOL.

Impacts of continued work on a MEP product specification would include the following:

- continued workload on the participants of the task group
- require a contribution of competent expertise in the areas of register creation, maintenance, and feature/attribute structure
- require continued cooperation with environmental and scientific partners
- one or two workshop meetings with technical and environmental experts within a year timeframe

The expected deliverables from continued work on a Marine Environmental Protection product specification would include a draft product specification for environmental features utilizing features from an environmental/scientific register that is separate from existing S-100 registers.

Appendix 1

GEO OBJECT CLASS

Feature:	**Marine Protected Area**

Acronym: **mpaare**

Set Attribute_A: DATEND; DATSTA; JRSDTN; NATION; NOBJNM; OBJNAM; PEREND; PERSTA; RESTRN; STATUS;

Set Attribute_B: INFORM; NINFOM; NTXTDS; PICREP; SCAMAX; SCAMIN; TXTDSC

Set Attribute_C: SORDAT; SORIND

Definition:

Marine Protected Area**:** Any area of the intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which as been reserved by law or other effective means to protect part or all of the enclosed environment. (IUCN – The World Conservation Union. 1998. Resolution 17.38 of the 17th General Assembly of the IUCN. Gland, Switzerland and Cambridge, UK.)

INT 1: IN 22

M-4: 437.3;437.6

Remarks:

Distinction: caution area; marine farm/culture; military practice area; restricted area

INFORMATION TYPE OBJECT

Feature:	**Marine Protected Area details**

Acronym: **mpadet**

Set Attribute_A: catmpa, DATEND; DATSTA; DRVAL1; DRVAL2; iuccat; mpapen; mpareg; NOBJNM; OBJNAM; PEREND; PERSTA; RESTRN; STATUS;

Set Attribute_B: INFORM; NINFOM; NTXTDS; PICREP; SCAMAX; SCAMIN; TXTDSC

Set Attribute_C: SORDAT; SORIND

Definition:

Information about Marine Protected Areas.

INT 1:

M-4:

INFORMATION TYPE OBJECT

Feature:	**Marine Protected Area Penaltv**

Acronym: **mpapen**

Set Attribute_A: DATEND; DATSTA; penlty; PEREND; PERSTA

Set Attribute_B: INFORM; NINFOM; NTXTDS; TXTDSC

Set Attribute_C: SORDAT; SORIND

Definition:

Information about penalties for violating Marine Protected Area regulations.

INT 1:

M-4:

Appendix 1

FEATURE OBJECT ATTRIBUTE

Feature:	**Category of MPA**

Acronym: **catmpa**

Attribute type: E

Expected input:

ID	Meaning	INT 1	M-4
1 :	ESSA	N 22;	B-437.1;
2 :	PSSA	N 22;	B-437.6;
3 :	coral reef		
4 :	fish sanctuary	N 22;	
5 :	seal sanctuary	N 22;	
6 :	bird sanctuary	N 22;	
7 :	nature reserve	N 22;	
9 :	research area		
10:	ecological reserve	N 22;	

Definitions:

Environmentally Sensitive Sea Area (ESSA):
a generic term which may be used to describe a wide range of areas, considered sensitive for a variety of environmental reasons. (IHO Chart Specifications, M-4)

Particularly Sensitive Sea Area (PSSA):
an area that needs special protection through action by IMO because of its significance for recognized ecological, socio-economic, or scientific attributes where such attributes may be vulnerable to damage by international shipping activities (International Maritime Organization).

coral reef — hard calcareous skeletons of many tribes of marine polyps. (IHO Hydrographic Dictionary, S-32, Volume 1)

fish sanctuary: a place where fish are protected

seal sanctuary: a place where seals are protected.

bird sanctuary:	a place where birds are bred and protected.
nature reserve:	a tract of land managed so as to preserve its flora, fauna, physical features, etc.
research area	an area where marine research takes place.
ecological reserve	a tract of land managed so as to preserve the relation of plants and living creatures to each other and to their surroundings.

FEATURE OBJECT ATTRIBUTE

Feature:	**IUCN Category**

Acronym: **catiuc**

Attribute type: E

Expected input:

ID	Meaning	INT 1	M-4
1 :	strict nature reserve		
2 :	wilderness area		
3 :	national park		
4 :	natural monument		
5 :	habitat/species management area		
6 :	protected landscape/seascape		
7 :	managed resource protected area		

Definitions:

Ia Strict Nature Reserve - Area of land and/or sea possessing some outstanding or representative ecosystems, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring.

Ib Wilderness Area - Large area of unmodified or slightly modified land, and/or sea retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition.

II National Park - Natural area of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible. .

III Natural Monument - Area containing one, or more, specific natural or natural/cultural feature which is of outstanding or unique value because of its inherent rarity, representative or aesthetic qualities or cultural significance.

IV Habitat/Species Management Area - Area of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species.

V Protected Landscape/Seascape - Area of land, with coast and sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and/or cultural value, and often with high biological diversity. Safeguarding the integrity of this traditional interaction is vital to the protection, maintenance and evolution of such an area.

VI Managed Resource Protected Area - Area containing predominantly unmodified natural systems, managed to ensure long-term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs.

(International Union for Conservation of Nature and Natural Resources publication "Guidelines forProtected Area Management Categories", IUCN, 1994)

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