5th HSSC Meeting
Shanghai, China, 5-8 November 2013

Paper for Consideration by the Hydrographic Services and Standards Committee

S-52 Presentation Library Edition 4.0

Submitted by:	DIPWG Chair
Executive Summary:	Description of the of steps taken to develop the new S-52 Presentation Library, Edition 4.0 and nature of the changes that have been made. A request is made for HSSC approval of the new edition.
Related Documents:	IHO S-64, IEC 61174 and 62288 revisions
	HSSC3-05.3B rev1, "Proposed Revision of S-52 Presentation Library"
Related Projects:	IHO S-64, IEC 61174 and 62288 revisions

Introduction / Background

As a result of the UKHO presentation of the paper HSSC3-05.3B rev1 at HSSC3 (Monaco Nov 2011), the HSSC directed that development of a new edition of the S-52 Presentation Library be added to the DIPWG work plan. The purpose of the revision was to address known "ECDIS anomalies" and implementation irregularities, and to improve the overall clarity of the specification.

At HSSC4 (Taunton Sep 2012), the DIPWG Chair reported that, "The intent was to have a draft PresLib Ed. 3.5 ready for discussion at the next TSMAD meeting in January 2013, and then reviewed at the joint TSMAD/DIPWG meeting in May 2013 for endorsement at HSSC5." An extensive revision of the Presentation Library was prepared and presented at TSMAD25 (Tokyo Jan 2013). There was some concern expressed at the meeting that the extent of changes proposed in the draft exceeded the original intent to only correct inconsistencies and clarify ambiguous portions of the specification. There was also concern that the DIPWG resources, primarily Original Equipment Manufacturers (OEMs), might not be able to provide the appropriate level of support for the development and review of the new Presentation Library.

Nevertheless, the DIPWG Vice Chair, Tom Mellor (UKHO), was able to facilitate two iterations of review by correspondence prior to DIPWG5 (Silver Spring Jun 2013). It was decided during this time that the extent of the changes being recommended for the Presentation Library merited use of a full major version number increase (to 4.0 instead of 3.5). In response to comments received prior to the meeting, the UK proposed (TSMAD26/DIPWG5-8.1D) that, "an expert DIPWG panel is setup with the authority to review and amend the new Preslib as necessary." DIPWG agreed to establish:

> "a 'PresLib 4.0 finalization Sub-WG' in order to review and finalise the draft edition of S-52 Ed 4, without making any further content changes. The Sub–WG is to provide the disposition of the review comments received to DIPWG. The work is to be completed in time for submission to HSSC5, for approval."

During DIPWG5, a three-day break-out session of a dozen participants made significant progress in de-conflicting and resolving the review comments received prior to the meeting. However, the sub-working group, composed primarily of OEMs, needed more time to finalize the presentation library and agreed to meet twice more during the summer. Nine members were able to attend a session in July and seven attended a session in late August (See Annex B for details of meetings and participants).

During the review the group identified a need to revise the colour calibration section of the main S-52 document, which contained errors and obsolete references to CRT technology in Annexes B and C. The required changes were made by the group and will require the main S-52 version to increment from 6.0 to 6.1.

As the review sessions progressed, consensus grew amongst the dozen experts in the sub-working group that additional areas required revision and that future inconsistencies and "ECDIS anomalies" could be reduced by limiting the number of implementation options that were available to manufactures in the current edition of the Presentation Library. Thus, the original direction by DIPWG to the group to proceed, "without making any further content changes," was not strictly adhered to, but the content changes developed by the group fit within the existing functionality required of ECDIS. For example, a new symbol was developed to highlight seasonal buoys and other date dependant features to improve mariners' ability to conduct voyage planning.

Analysis/Discussion

Nature of the Changes

Throughout the review process the language within the Presentation Library has been modernised and many of the old diagrams and examples have been replaced to bring the document up-to-date. Many chapters contained multiple options to perform the same task, leading to ECDIS inconsistencies. Therefore, where possible the options have been limited. Redundancies and repeated copies of several tables within the specification have been eliminated, as have elements that have never been implemented, such as raster symbol definitions. To reduce the size of the document and to simplify its use for developers the lookup and colour tables have each been removed from Part I and placed into separate files.

Detailed examples have been added to provide ECDIS developers with clear guidance for implementing the more complex parts of the ECDIS presentation. New symbols have been included to assist the Mariner when selecting to view date dependent features and automatic updates.

A number of changes have been made to reflect the requirements in the revised IMO Performance Standard for ECDIS. For example, the document has introduced new sections for detection and notification of navigational hazards, detection of areas for which special conditions exist and detection of the safety contour. These new sections now provide clear guidance on the S-57 objects and attributes that must initiate an alert and/or indication within ECDIS. These changes will have a positive impact for the mariner by reducing the number of extraneous alarms in ECDIS. The Presentation Library now makes it mandatory to use the viewing groups in the IMO Performance Standard, Appendix 2. This will enable all mariners to have greater control over tailoring their ECDIS display and will help reduce screen clutter.

The complex Nassi-Shneiderman diagrams used to describe the Conditional Symbology Procedures (CSPs) have been converted to Unified Modelling Language (UML). The inconsistent use of some terms within the CSPs has also been eliminated.

Mariner feedback has been crucial in updating the S-52 Presentation Library and in response to their comments a number of changes have been made. For example, the display of text has been added to selected features so that this information is available to the mariner without having to view a "pick-report." For example, anchorage area and fairway names are now shown directly on the ECDIS chart display.

Review and Approval of the New Presentation Library

The schedule for the development, review and approval of a new edition of the S-52 Presentation Library that was presented to HSSC4 did not come to pass. The final version of the S-52 Ed 6.1 and Presentation Library Ed 4.0 were completed by the sub-working group in early September 2013.

The full DIPWG membership is being provided the updated Presentation Library concurrent with its submission to HSSC5. Although the full DIPWG membership has not yet reviewed the final version of the proposed changes, nearly half of the companies that regularly attend DIPWG meetings sent representatives to participate in crafting the changes. These OEMs and other participants in the sub-working group are the core of the most dedicated DIPWG experts who are routinely relied upon by the member state representatives in DIPWG to provide expert advice on technical aspects of S-52. If approval was delayed until another full meeting of the DIPWG (Spring 2014) the same experts that DIPWG sent off to create the new Presentation Library would again be asked to weigh in on the quality of the product before the member states voted to approve the changes. Waiting for next spring for the full DIPWG to approve the specification would also impact development of a new version of S-64.

Given that these experts have developed and now endorse the new Presentation Library and given that member states responding to IHO circular letters for approval of specification changes can consult with their country's IHO working group representatives in DIPWG and TSMAD in formulating their vote, we believe that the interests of the member states can still be served by HSSC endorsing the new S-52 Edition 6.1 and Presentation Library 4.0, without waiting for a formal endorsement by the full DIPWG.

Dependencies
The IEC is working on a new edition of IEC 61174, "Electronic chart display and information system (ECDIS) – Operational and performance requirements, methods of testing and required test results." The revised IEC 61174 refers all ECDIS chart related tests to S-64. In turn the new version of S-64 will test the new requirements in S-52 Presentation Library Ed 4.0.

Many of the changes instituted in the new Presentation Library will ultimately be carried forward into the implementation of portrayal aspects of S-100 and S-101.

Recommendations

The HSSC should endorse the new S-52 Edition 6.1 and Presentation Library Edition 4.0 and refer them to member states for approval through circular letter.

Justification and Impacts

DIPWG was directed to develop a new version of the S-52 Presentation Library at HSSC3. The delivery of Presentation Library Edition 4.0 and S-52 Edition 6.1 to HSSC5 fulfils this task.

Development S-64 is dependent on approval of the new editions of these S-52 documents. Timely approval of the Presentation Library will serve to provide clearer guidance to ECDIS OEMs, reduce "ECDIS anomalies," improve ECDIS type approval testing, enhance ECDIS functionality for mariners and create greater safety of navigation.

Action Required of HSSC
The HSSC is invited to:

    a.   **endorse** the draft IHO S-52 Edition 6.1 and Presentation Library Edition 4.0

    b.   **note** the inter-dependencies with other standards and assist with their development

    c.   **acknowledge** the efforts of the UKHO, particularly Tom Mellor, for managing the development of the new Presentation Library and also the contributions of the subject matter experts listed in Annex B, without which this work could not have been accomplished.

New Mandatory ECDIS Requirements

S-52 e4.0 Clause	Description	Justification
10.3.4.4	Ability to turn Isolated Dangers in Shallow Water on/off	**Existing feature in e3.4 changed from optional to mandatory** This allows the Mariner the flexibility to navigate in shoal areas with or without the isolated danger symbol.
10.4.2	Ability to turn off SCAMIN in ECDIS	SCAMIN is not universally applied by HO's in the same way. Mariners need to be able to view all data and need a function to turn the SCAMIN attribute off.
10.5.7	Display of the shallow water pattern. Optional in e3.4	**Existing feature in e3.4 changed from optional to mandatory** Safety critical feature as it becomes increasingly difficult to detect the changes in the depth shades in ECDIS night pallet.
10.5.9	Detection and Notification of Navigational Hazard. Lists the S-57 features and attributes that will raise an indication.	**IMO PS Requirement** Enables clear and transparent identification of objects that will raise an indication within the ECDIS.
10.5.9	New Mariner Object 'indhlt'	**IMO PS Requirement** Designed for conditions that require a highlight in the ECDIS chart area, to conform to IMO requirements IMO has dictated the colour red shall only be allowed for alarms in ECDIS and that the colour yellow shall be used for warning and cautions. Design of a graphical highlight symbol in colour yellow. The current S-52 traditional graphical highlight symbol dnghlt is red.
10.5.10	Detection of Areas, for which Special Conditions Exist. Lists the S-57 features and attributes that will raise an indication or alert as defined by the Mariner	**IMO PS Requirement** Enables clear and transparent identification of objects that will raise an indication or alert within ECDIS as defined by the Mariner.
10.5.12	Detecting the Safety Contour. Lists the S-57 feature and attribute combinations required to detect the safety contour Rocks, Wrecks and Obstructions have been removed in e4.0 from detection of the safety contour process and moved to Detection and Notification of Navigational Hazards. This change is in line with the IMO PS requirement	**IMO PS Requirement** IMO PS states that rocks, wrecks and obstruction will only be an indication. Removing them from detecting the safety contour will reduce the number of audible alerts in ECDIS.

10.6.1.1	New viewing group created to allow separate display on/off for INFORM01 symbol: "Highlight info" for INFORM and NINFRM. "Highlight document" for TXTDSC, NTXDSC and PICREP.	**IMO PS Requirement** Mariner feedback during IMO Oct 2012 ECDIS meeting expressed irritation at not being able to control the display of features in ECDIS as there were not enough selectors. This was sighted as a major reason for cluttered ECDIS display.
10.7.2	Use of new symbols for identifying automatic ENC updates	**IMO PS Requirement** Previously no standardized symbols available
14.3	Adoption of the IMO PS naming convention for ECDIS viewing groups available in ECDIS	**IMO PS Requirement** Mariner feedback during IMO Oct 2012 ECDIS meeting expressed irritation at not being able to control the display of features in ECDIS as there were not enough selectors. This was sighted as a major reason for cluttered ECDIS display.

Changes and Clarifications

S-52 e4.0 Clause	Description	Justification
	Inserted Standards Terms and Definitions	
	Inserted new text boxes are used to highlight important text and notes in the new edition of the standard	**Clarification** Highlights critical points in ECDIS presentation for developers
Annex A	FLODOC, PONTON, HULKES display priority changed from 5 to 1	**Error in LUT entries** These objects are part of group 1, skin of the earth objects, they all have a solid area fill and should be lowest in the drawing priority. Before the change for example cranes in a flodoc area were masked by the high priority drawing of solid brown colour.
Annex A App A	The Mariner colours introduced by MD8 have been included in S-52 e4.0 NINFO has been removed from the list of colour tokens that can be substituted.	MD8
	Description of the Symbology Instructions, removed Backus-Naur diagrams and replaced with POSIX style manual pages	
10.1.3	ECDIS shall only display one ENC chart in an area where ENC cells of the same scale and usage overlap	**Clarification** Unfortunately despite best efforts ENC from different HOs sometimes do overlap. Previously there was no guidance on how overlaps should be handled in ECDIS. Mixing of overlapping charts created cluttered and unusable displays.

10.4	A means to insert a date or date range to display date dependant features. New symbol to indicate where in the chart display the objects with temporal attributes are located	e3.4 provided two options to perform this function, select date or show all. e4.0 has removed the show all option as it was confusing for the Mariner. E4.0 has also introduced a new symbol that will indicate the presence of temporal attributes on features.
10.3.3.8	Use of default symbol NEWOBJ01 if SYMINS instruction cannot be understood	**Clarification** Fail safe procedure
10.6.2	The ECDIS legend will be made available at the position selected by the Mariner	**Change** Ensuring the chart legend is available from the location chosen by the Mariner will remove any confusion about what data should be displayed when the own ships position is not on the ECDIS chart screen.
10.8.5	Guidance on the use of hover over function for a limited number of S-57 features	**Change** Speeds up chart enquiry by the user. Recommendation from IEC 61174 drafting committee.
	CSP name change LIGHTS05 - LIGHTS06	**MD8** New colour added, blue and to allow the display of 360 degree major light sectors with a nominal range of 10nM or greater. MD8
	CSP name change LITDSN01 - LITDSN02	**MD8** New colour added, blue
	CSP name change SYMINS01 - SYMINS02	**Clarification** Default symbolization instruction added
	CSP name change SNDFRM03- SNDFRM04	**MD7** Introduction of new attribute found by Diver
	CSP name change SOUNDG02	**MD7** No change to CSP, numbering changed as CSP calls sub-procedure SNDFRM
	CSP name change WRECKS04 – WRECKS05	**MD7** No change to CSP, numbering changed as CSP calls sub-procedure SNDFRM
	CSP name change OBSTRN06 – OBSTRN07	**MD7** No change to CSP, numbering changed as CSP calls sub-procedure SNDFRM
	CSP name change RESARE03 – RESARE04	**MD8** To harmonize portrayal of entry prohibited restricted areas with INT 1
8.5.1	When areas are split by the ECDIS screen the system shall display centred symbols in each part	**Clarification**

10.9	Display of TS_PAD template in ECDIS pick report	**Clarification** Previously no guidance on how the data from the S-57 feature TS_PAD should be presented in the pick report.
S-52 ENC Symbol Catalogue	All conspicuous symbols shall be drawn with a 0.6 line width All non-conspicuous symbols have 0.3 line width	**Clarification** Logical consistency, the more prominent a feature the more distinguishable it should be in the ECDIS chart display
Annex A App B, C, D, E, F	ALL LUT entries with CONRAD 1 or 3 changed to suppressed.	**Clarification**
Annex A App B, C, D, E, F	Found typo style errors have been fixed for CURENT, FERYRT, LNDMRK, RCRTCL, VEGATN	**Clarification** As part of the expert review process the existing printed version of the LUT has been fixed for typo style errors
Annex A App B, C, D, E, F	Selected meta object without visible presentation has been modified to have viewing group, category, priority, etc, but still no visible symbol. This allow Picke report to recognise them: M_ACCY, M_HOPA, M_SDAT, M_SREL, M_VDAT	**Clarification** A technical method to access meta objects by Pick report has been clarified
Annex A App B, C, D, E, F	Selected meta object without visible presentation has been modified to have visible presentation: M_NPUB	**Clarification** Technical possibility for ECDIS and practical graphical indication for mariner to access Nautical publication using Pick report

Deletion

S-52 e3.4 Clause	Description	Justification
4.1	User Interface Colours	MSC.191(79) and IEC 62288 set rules for user interfaces within ECDIS.
6	The Raster-Symbol Description Format	Presentation Library 3.4 does not contain any raster symbol definitions and has never provided details.
10.5.7	Raster Image Pattern Definition	Presentation Library 3.4 does not contain any raster image pattern definitions
10.6.7	Raster Image Symbol Module Example	Presentation Library 3.4 does not contain any raster symbols
	All Mariners Objects, symbols and LUT entries	IMO and IEC 62288 is the authority for Mariner objects

Annex B

Expert Group Meetings

DIPWG 5   Washington (Silver Spring) – NOAA   10-14 June 2013

Jochen Rittersbuch	BSH
Robert Powell	Comarkcorp
Hannu Peiponen	Furuno
Pol Le Bihan	GEOMOD
Eivind Mong	Jeppesen
David Blevins	NG Sperry Marine
Michael Herrick	NG Sperry Marine
Colby Harmon	NOAA – DIPWG Chair
Geoffroy Scrive	SHOM
Mikan Stamenkovich	US Navy, SPAWAR ATLANTIC
Konstantin Ivanov	Transas
Thomas Mellor	UKHO – DIPWG Vice Chair

PresLib Session 1   Hamburg – BSH   22-26 July 2013

Jochen Ritterbusch	BSH
Hannu Peiponen	Furuno
Pol Le Bihan	GEOMOD
Eivind Mong	Jeppesen Marine
Konstantin Ivanov	Transas
Thomas Mellor	UKHO
Mikan Stamenkovich	US Navy, SPAWAR ATLANTIC
Holger Bothien	7Cs
Olaf Wenzel	7Cs

PresLib Session 2   Taunton – UKHO   27-30 Aug 2013

Jochen Ritterbusch	BSH
Hannu Peiponen	Furuno
Eivind Mong	Jeppesen Marine
David Blevins	Sperry Marine
Konstantin Ivanov	Transas
Thomas Mellor	UKHO
David Grant	US Navy, SPAWAR ATLANTIC