**4th S-100 Working Group (S-100WG) Meeting**
**Aalborg, Denmark (27 Feb – 1 Mar 2019)**
**Minutes**

**Chair:** Julia Powell (USA - NOAA)
**Vice Chair:** Yong Baek (Rep of Korea – KHOA)
**Secretary:** Anthony Pharaoh (IHO Secretariat)

**Annexes:**
Annex A - Actions
Annex B – Agenda
Annex C – List of Participants

Action numbers are listed against each agenda item in these Minutes. Refer to Annex A for the list of actions.

**WG Member abbreviations:**

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| AA | Al ARMSTRONG |
| AH | Axel HAHN |
| AK | Abri KAMPFER |
| AL | Andrei LUCACI |
| AM | Arno MEURINK |
| AP | Anthony PHARAOH |
| BC | Bruno CARDOSO |
| BML | Ben McLachlan |
| BS | Briana Sullivan |
| CW | Chris Williams |
| DB | David BRAZIER |
| DG | David GRANT |
| DJ | Darja JOKK |
| DL | R. david Lewald |
| DlD | Denise LADUE |
| EH | Elizabeth HAHESSY |
| EK | Edward KUWALEK |
| EM | Eivind MONG |
| EW | Edward Weaver |
| FY | Federico YANGUAS |
| GS | Gumjun SON |
| HA | Hugh ASTLE |
| HB | Holger BOTHIEN |
| HF | Hillary FORT |
| HN | Hazel NEWMAN |
| HP | Hannu PEIPONEN |
| JC | Joshua CLAYTON |
| JnW | Jin WU |
| JP | Julia POWELL |
| JR | Jochen RITTERBUSCH |
| JV | Jana VETTER |
| JW | Jeff WOOTTON |
| MH | Mikko HOVI |
| KhS | Kim Ho Sung |
| LD | Lucian DUTU |
| LP | Lynn PATTERSON |
| LZ | LIN ZHANG |
| MK | Minjeong Kim |
| MP | Mathias PALM |
| MR | Marc Roesbeke |
| NK | Namseon KANG |
| NL | Nick LEMON |
| OaF | Odd Aage FOERE |
| PoS | Per-Olof Seiron |
| PU | Peter UNDERWOOD |
| RcF | Ricardo FREIRE |
| RF | Richard FOWLE |
| RM | Raphael MALYANKAR |
| SL | Seojeong Lee |
| SO | Sewoong Oh |
| SR | Sungsoo RYU |
| SS | Svein SKJAEVELAND |
| TB | Tingying BAI |
| TdP | Tom DE PUYT |
| TN | Tamer Nada |
| TR | Tom RICHARDSON |
| VP | Valentino PALMA |
| WX | Wan XIAOXIA |
| YB | Yong BAEK |
| YH | Yi HAN |
| YJ | Yujun Jeong |
| YK | Yann KERAMOAL |
| YW | Yuxiao WU |

## 1. Opening and Administrative Arrangements

The S-100WG Chair Julia Powell welcomed participants to the Aalborg meeting and invited Elizabeth Hahessy to read a welcoming address from the Director of the Geodatastyrelsen agency, Pia Dahl Hojgaard. She emphasized the importance of standards development, noting that common standards

are paramount for ensuring that data are unambiguous, easy to understand and easy to use in combination with other standards.

The Chair expressed her appreciation for the warm welcome and for the exceptional logistics preparations and warm welcome. She invited the IHO Technical Director – Abri Kampfer, to address the meeting.

Abri Kampfer noted that there were more than 60 participants, representing 21 Member States and 18 industry or academic organizations, attending the meeting, and this was an important indicator of the importance of this Working Group. He reminded the meeting that the International Maritime Organization's e-Navigation *Strategic Implementation Plan* requires that all Maritime Services be S-100 conformant as a baseline. The International Hydrographic Organization (IHO) S-100 framework standard specifies the method for data modelling and developing product specifications.

S-100 edition 4.0.0 was published in December 2018, and the maritime world is watching with great anticipation and expectation, for the products and services that are being developed. We must therefore endeavour to deliver on those expectations within the time frames that we set ourselves.

He wished the delegates a successful meeting.

Chair reported on achievements for 2018. These included the publication of S-100 Edition 4.0.0 and S-101 Edition 1.0.0. The S-100WG also made significant progress on: S-102 High Resolution Bathymetry Edition 2.0.0; S-121 Maritime Limits and Boundaries Edition 1.0.0; S-129 Under Keel Clearance Management Edition 1.0.0; S-97 Product Specifications Developers Guidebook Edition 1.0.0; and S-98 Specification for Data Interoperability in S-100 Navigation Systems Edition 1.0.0

Goals for 2019 include further development of the IHO GI Registry; the incorporation of Marine Resource Naming into S-97; the continual maintenance of S-100 to meet the needs of the wider user community and the encouragement of stakeholder engagement.

## 2. Approval of Agenda

The meeting approved the agenda with some minor changes and with agreement that WG reports be moved to end of the agenda.

Korea – questioned whether the S-121 Product Specification will be voted on by the meeting. The Chair responded that due to the late submission of the documents, and noting their large size, the WG would not be asked to approve the S-121 Product Specification at the meeting.

## 3. Matters Arising and HSSC Working Group Reports

### 3.1 Approval of S-100WG3 Minutes

The Chair briefly reviewed the minutes of the second meeting and noted that they had previously been distributed and approved by the WG.

### 3.2 Review of S-100WG3 Actions

The Chair reviewed the list of actions from previous meetings:

| No. | Item | Action | Who | Status |
|---|---|---|---|---|
| 01 | 3.2 | S-100WG2 Action 20: Liaise with OGC regarding RDF and the Semantic Web. | JP | Close<br>Passive |
| **02** | **3.2** | **S-100WG2 Action 24: Develop guidelines for the use of Codelist type attributes for inclusion in the IHO GI Registry proposal guidelines; and consider additional guidance for the S-100 document.** | **JW** | **Ongoing** |
| **03** | **3.2** | **S-100WG2 Action 25: Conduct a review of S-99 and produce a new edition based on the accrued practical experience with the Registry and related decisions made at S-100WG2.** | **JW** | **Ongoing** |
| 04 | 3.2 | S-100WG2 Action 26: Contact S-100WG Project Team leads to determine who will need access to the FCB. | Chair | Closed |
| 05 | 3.2 | S-100WG2 Action 30: Establish a new online resource for making available and maintaining all S-100 based test resources including Test Data Sets and Catalogue files (including all historical versions). | Vice Chair | Completed<br>(Registry 3.0) |
| 06 | 3.2 | S-100WG2 Action 32: Complete the Data Protection documentation for inclusion in S-100. (Finalise the specification – include guidance for implementers, and consider third part users. Provide further guidance on the use of the serial.txt and products.txt – taking into account the IMO requirement). | JP (lead) | Completed (S-100ed4) |
| 07 | 3.2 | S-100WG2 Action 35: Draft a new part for S-100 Lua Scripting; to support the development of Alarms and Indications, interoperability, and other script based extensions to the main functionality described in S-100. | SPAWAR | Completed<br>(S-100ed4) |
| 08 | 3.2 | S-100WG2 Action 36: Define the process of managing roles and feature associations to be used during the creation of a Feature Catalogue, and produce guidance on this process - to be included in S-99. | KHOA<br>JW | Completed<br>(See Paper 4-6.11) |
| 09 | 3.2 | S-100WG2 Action 37: Include functionality for managing the creation of the roles and feature associations to be included in a Feature Catalogue in the next iteration of the S-100 FCB. | KHOA / IHO Sec. | Completed<br>(FCB 2.0.0<br>See Paper 6.11) |
| **10** | **3.2** | **S-100WG2 Action 38: Include proposed test cases for the initial S-100 conversion tool in the test case document.** | **Chair** | **Ongoing** |

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| 11 | 3.2 | S-100WG2 Action 41: Draft the necessary text to make provision for the generic (S-100 conformant) display of RADAR overlay information. This should include the addition of a RADAR_OVERLAY portrayal context parameter to the S-101 Portrayal Catalogue. (The portrayal rules will have to be modified accordingly). | SPAWAR | Completed |
| **12** | **3.2** | **S-100WG2 Action 42: When building the next iteration of the Portrayal Catalogue, take into account the need for a context parameter to handle over / under radar.** | **SPAWAR / KHOA** | **Ongoing** |
| 13 | 3.2 | S-100WG2 Action 47: NATO GMWG to be invited to submit their proposals (A, B and C) to the Register manager. | JW | Close<br>Overtaken by events |
| **14** | **3.2** | **S-100WG2 Action 50: Submit a paper to the DQWG to discuss the definition of the enumerated values for attribute Quality of Horizontal Measurement.** | **CMo** | **Ongoing**<br>**Will be reported at S-101PT** |
| 15 | 4.1 | Remove arcByCenterPoint and circleByCenterPoint from the list of geometric primitives in model of the Feature Catalogue. Also remove from the Feature Catalogue Builder. Change UML diagram as well as to the table 5-A-20. | JW / KHOA | Completed |
| 16 | 4.2.1 | Include the metadata redline document, provided with proposal 4.2.1, into S-100 Edition 4.0.0 | JW | Completed |
| **17** | **4.2.1** | **Rework the digital signature proposal based on the discussion of mandatory status of digital signatures as implemented at the S-100 and PS levels** | **EM** | ***For S-100 Ed. 5***<br>***Proposal for next meeting*** |
| 18 | 4.2.2 | Further develop, and resubmit the proposal to add an integer type attribute *Number* to S100_ProductSpecification. | EK, HB, DG, EM | Completed |
| 19 | 4.2.2 | Add final agreed new attribute *Number* to S100_ProductSpecification at Appendix 4a-D (UML and corresponding table). | JW | Completed |
| 20 | 4.2.3 | Amend *S100_SupportFileDiscoveryMetadata:otherDataType* and *S100_SupportFileDiscoveryMetadata:dataTypeDescription* descriptions as proposed in paper 4.2.3. | JW | Completed |

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| 21 | 4.2.4 | Concerning metadata proposals (paper 4.2.4 items 2,3,4,5,6,8), an updated redline copy is to be forward to TSSO for inclusion in S-100 Edition 4. (EM, JW). | EM, JW | Completed |
| 22 | 4.2.5 | Apply amended proposal as presented for *S100-_DataFormat* for S-100 Edition 4.0.0. | JW | Completed |
| **23** | **4.2.5** | **Further develop the proposal for the values of *S100-_DataFormat*, also taking into consideration the inclusion of S-100 compliance levels, for a more consolidated proposal for S-100 Edition 5.** | **EM, HP, HB, DG** | ***Ongoing For S-100 Ed. 5***<br>*See compliance level paper* |
| 24 | 4.2.6 | Prepare redline to agree with the changes to S-100 Part 4a proposed in paper 4.2.6; and incorporate in S-100 Edition 4.0.0. | EM, JW | Completed |
| 25 | 4.3 | Include extra guidance on the interpolation method for bSline (for projection onto a spheroid). | EM | Completed |
| 26 | 4.3 | Include text to indicate that bSline should not be used for depth curves (or any other linear navigationally significant features). | EM | Completed |
| **27** | **4.3** | **Request the DQWG to check quality aspect related to the bSpline issue.** | **Chair** | **Ongoing** |
| **28** | **4.3** | **Draft new guidance on the interpolation of the spatial on the spheroid for S-100 Part 7.** | **HB** | ***For S-100 Ed. 5 for next TSM meeting*** |
| 29 | 4.4 | GML Clarifications to be incorporated in the Part 10b redline; and incorporated in S-100 Edition 4.0.0. | EM, JW | Completed |
| 30 | 4.5.1 | Prepare new S-100 Part 9a (Lua Portrayal) redline; and incorporate in S-100 Edition 4.0.0. | DG, JW | Completed |
| 31 | 4.5.2 | Prepare new S-100 Part 13 (Scripting) redline; and incorporate in S-100 Edition 4.0.0. | DG, JW | Completed |
| **32** | **4.5.2** | **SPAWAR to investigate how to implement a catalogue for ECDIS alerts and indications (see old action)** | **SPAWAR, HB, HP** | *For S-100 Ed. 5 for next TSM* |
| 33 | 4.6 | Complete development and prepare redline for new S-100 Part 15 (Data Protection), including holding a Data Protection Workshop in conjunction with S-101PT3 meeting (June 2018). | RS, HB, HP, AP | Completed |

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| 34 | 4.6 | Incorporate new S-100 Part 15 (Data Protection) redline in S-100 Edition 4.0.0. | JW | Completed |
| 35 | 4.7 | Prepare new S-100 Part 14 (Online Data Exchange) redline; and incorporate in S-100 Edition 4.0.0. | EM, JW | Completed |
| 36 | 4.8 | Apply proposal as presented for attribute *featureUseType* for S-100 Edition 4.0.0. | JW | Completed |
| 37 | 4.9 | Apply proposal as presented for data type *Time*, as prepared at S-100WG3 (refer Minutes Annex E) for S-100 Edition 4.0.0. | JW | Completed |
| 38 | 4.10 | Include updated Part 10c (HDF5 Data Format) as presented at S-100WG3 in S-100 Edition 4.0.0. | EM, JW | Completed |
| **39** | **4.11** | **Continue to update the Registry model for the Concept register (and other extensions) – for possible review at the next TSM.** | **KHOA, JW** | ***For S-100 Ed. 5*** *JW/YB to prepare paper for next TSM* |
| 40 | 5.1 | Report to HSSC the revised publication timeline for S-98. | Chair | Completed |
| **41** | **5.2** | **Add the development of the Interoperability Catalogue Builder to the S-100WG Work Plan.** | **Chair** | Ongoing – will complete for HSSC |
| 42 | 6.2.1 | Invite appropriate Working Groups and Project Teams to appoint members to participate in the work of the GI Registry Project Team; and to participate in the Registry Workshop to be held in conjunction with S-100WG4. | JW | Closed |
| 43 | 6.2.3 | Inform HSSC10 meeting, about the activity to develop the Registry Guideline document (Annex A to S-99) as part of the S-100 report to the HSSC. | Chair | Completed |
| 44 | 6.4 | Include guidance on file naming conventions (based on paper 6.4) in the PS Guide book, taking into account the comments made during the meeting. | Chair | Completed |
| 45 | 6.4 | Amend S-101 Product Specification Main document to reflect the recommendations in the paper and the decisions of the S-100WG. | JW | Completed |
| 46 | 6.6 | Develop a generic set of validation tests that can be used as the basis in the development of all S-100 based Product Specifications. | BC (lead), HB, JLP, TR, SS, JW | Completed( See paper 4-4.5) |

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| 47 | 6.8 | Invite IEHG to harmonise their portrayal (colour tokens, style sheets and IE specific symbols) with those in the new Registry. | DLD | Completed /Ongoing |
| **48** | **6.8** | Include portrayal Colour Style Sheets (CSSs) in the Registry and **include explanatory text in S-99**. | KHOA, JW | Completed (KHOA)/ **Ongoing (JW)** |
| 49 | 6.9.2 | Submit paper 6.9.2 (Methodology for the display of quality information) to the S-101 PT meeting (June 2018) and the DQWG meeting (January 2019). | DQWG Chair | Completed |
| 50 | 6.10 | Submit paper 6.10 to the S-101PT (June) meeting for further consideration. | SO | Completed |
| 51 | 6.10 | Investigate the extent of large numbers of data coverage's within HOs ENCs – to report back to the June S-101PT3 meeting. | ICENC, PRIMAR | Completed |
| 52 | 6.10 | Enquire whether the KHOA S-1xx datasets can be made available for testing. | KHOA | Closed |
| 53 | 7.2 | S-100WG to review and comment on the first edition of the S-121 standard and to feedback comments in time for the documents to be updated prior to HSSC submission in May 2018. | All | Overtaken by events. |
| 54 | 7.2 | Request a MLB domain for Maritime boundaries at the HSSC10 meeting. | Chair | Closed |
| 55 | 7.3 | Request a UKCPT domain for Under Keel Clearance Management at the HSSC10 meeting. | Chair | Completed |
| 56 | 7.4 | Change the S-100 revision timeline for new editions to every 2 years | Chair | Completed |
| **57** | **8.3** | **Change the catalogue filename example for S-100 Edition 4 (S-100 Part 4a, Appendix 4a-D – exchangeCatalogueName).** | **Chair** | **Ongoing** |
| **58** | **8.3** | **Send email to all WG PT developers to inform them that catalogue file will be called "catalogue.xml".** | **Chair** | **Ongoing** |
| **59** | **8.3** | **Include content about product catalogue structure in the guideline document.** | **Chair** | **Ongoing** |
| 60 | 8.5 | Provide proposals on S-100 related recommendations for inclusion in S-100 Edition 4.0.0 redline. | SPAWAR | Complete |

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| 61 | 9.3.3 | Examine whether the draft checklist developed by IEC can be included in the S-100 Testbed documentation. | Chair | Completed (paper 4-8.1) |

3.3 HSSC10 Report

The Chair provided a brief report on the activities / outcomes of the 10th HSSC meeting that took place in Rostock-Warnemünde, Germany (14-17 May 2018). She reported on the new regime for releasing Edition 1.0.0 Product Specifications for implementation and testing. This was discussed at Council, and presented as the revised publication schedule which will be submitted to the next HSSC meeting.

3.4 HSSC Actions

Status of actions assigned to S-100WG.

HSSC10/04 - ENCWG and S-100WG to monitor any possible impact of the work on the agreed e-Navigation outputs on ECDIS related standards and S-100. Ongoing. (See report to HGDM).

HSSC10/05 - Investigate if S-101 ENCs will meet the current IMO Performance Standards so there is no need to consider proposing amendments to the IMO. Ongoing. (Chair to report to HSSC on papers S-100WG4-6.1 – Readiness; and S-100WG4-6.10 - Conversion of datasets for ENC validation, ECDIS type approval and security).

HSSC10/14 - S-99 – UKCMPT to justify in according with S-99 the need for the establishment of an UKCM Domain within the Feature Concept Dictionary. Closed. (Following discussion at the GI Registry Workshop, it was agreed that there was no need for an UKCM Domain. All S-129 features/attributes have been moved to the IHO Hydro Domain. Chair to report to HSSC11).

HSSC10/15 - S-121PT to justify in accordance with S-99 the need for the establishment of a Maritime Limits and Boundaries Domain within the Feature Concept Dictionary (Ongoing) JW – they are making their submissions to the IHO Hydro Domain (Chair to report to HSSC11).

HSSC10/18 - S-100WG/S-121PT to keep HSSC Chair/Sec updated on the progress made on the development of S-121 according to the timelines and milestones given at HSSC-10 (Ongoing). (S-121 Edition 1.0.0 submitted to S-100WG4 for review – to be reviewed via WG Letter. Comments to be sent to S-121PT for consideration/action – then published as Edition 1.0.0 for testing. Chair to report to HSSC11).

HSSC10/19 - S-100WG to consider how to incorporate generic interoperability into future editions of S-100. (Ongoing – white paper has been developed. S-98 still under development. Interoperability being tested during KHOA and SPAWAR test bed projects. Chair to report to HSSC11).

HSSC10/20 - S-100WG to further develop and finalize the Test Bed Platform and associated guidelines to be used by developers of S-100 based products. Ongoing. (The Chair noted that the new Registry includes a section for test bed reports, and she reported that a draft template document for documenting test beds had been submitted for discussion at the meeting).

HSSC10/26 - HSSC WGs and PTs' Chairs to identify the standards that need to be included in the revised Appendix of IHO Resolution 2/2007 and submit them to HSSC Chair/IHO Sec. for consideration. (Chair will make submission).

HSSC10/36 - S-100WG to include guidance on the "Data Quality Checklist for Product Specifications" Ongoing. (To be produced by DQWG and for inclusion in in S-97). (Chair - waiting for list from DQWG).

HSSC10/47 - DQWG to pursue the development of the conditional visualization methodology of quality of bathymetric data in liaison with NCWG, NIPWG, ENCWG, S-101PT. (Ongoing)

HSSC10/55 - S-100WG/DQWG to continue the development of recommendations (including mitigation measures) and monitoring of cyber security and quality assurance issues as reported by IEC/INTERTANKO. (Ongoing).

HSSC10/61 - IHO Sec. to make a proposal at HSSC11 for an IHO / ECDIS Stakeholder's Forum to be held in 2020. (Ongoing).

Council actions

Council action – stakeholders forum – can we have it at the next TSM meeting --- > with a bigger forum at HSSC 2020. (Ongoing). Council 2 – S-100 showcase at the third Council meeting. (Ongoing).

3.5 ENCWG Report.

ENCWG Vice-Chair (RF) reported that some issues had been reported with the S-52 Presentation Library / Chart 1. These included incorrect SYMINS attribute; and incorrect light descriptions displayed in screen shots. M_QUAL was also removed from Chart 1 cells. Some improvements were also made to the S-64 screen shots. S-58 edition 6.1.0 was published Sept 2018 and will come into force on 01 September 2019. The 'Critical' checks test data sets to support the mandation of S-58 have been completed and are currently undergoing final review before general release. The WG provided input to the IMO work on S-Mode. A HD-ENC sub-WG are working on compiling a production guidance document, to be added to S-65 as an Annex. A draft has been circulated for comments, and will be presented at a bathymetry workshop (Hamburg). The WG are also working on cyber security issues and are planning to produce a new edition of S-63, to sign ancillary files such as CATALOG.031, MEDIA.TXT, README.TXT, PERMIT.TXT, PRODUCTS.TXT, SERIAL.TXT and STATUS.TXT.

The next ENCWG meeting is scheduled to take place at the IHO Secretariat, Monaco from 10 to 12 June 2019 in conjunction with the S-101 PT Meeting (13 - 14 June 2019).

The meeting noted the report.

3.6 NCWG Report

The Chair of the NCWG (MH) reported that the WG had produced a new edition of S-4 that included revised clauses for the extended use of 'yacht' symbols, new islet symbol, magnetic variation and planes of reference. Several clarifications were produced and the issue of not being able to encode floodlighting in S-57 and S-101 identified. New tasks to be undertaken include revising S-11 Part A, Section 200 "Guidance for the Preparation and Maintenance of ENC Schemes" to cover also S-101 ENCs; completion of the "The future of the paper chart" document; and drafting of a list of the missing S-101 symbols.

The meeting noted the report.

3.7 NIPWG Activities

EM reported that the NIPWG had held its 5th meeting in Rostock, Germany from 28 January - 1 February 2019, in conjunction with a Digital Nautical Publications Stakeholders' Forum. The next NIPWG meeting will take place in Saint-Petersburg, Russian Federation from 25 to 29 November 2019.

EM provided a summary of experiences using the Feature Catalogue Builder (FCB). To test the FCB, he used the S-127 FCs (created manually) to compare the output from the existing FCB application. He noted that there were errors in enumeration numbering – from the Registry. There were also numerous cases of missing spaces between words. Some inconsistencies with character encodings. He proposed that in some cases, the Registry has implemented truncated dates incorrectly.

It was concluded that the multiplicity issues can likely be resolved by creating the feature catalogue from scratch in the FCB. Furthermore, it was considered that a handcrafted S-127 FC provides a better starting point for the first Edition of S-127 since this can be made to conform to the S-100 feature catalogue schemas.

He proposed that the issues discovered as a result of the exercise could be used to improve the FCB and the GI registry.

The meeting noted the report.

3.8 DQWG Report

The Chair reported that one of the principal goals of the DQWG is to develop and maintain a data quality checklist for product specification developers. This has been completed and will be included in the S-101PT validation checks. The DQWG have carried out reviews of the S-101, S-102 and S-127 Product Specifications. The WG has also worked with HO's to ensure the harmonized implementation of CATZOC, and also highlighted the difference between S-57 CATZOC and S-101 DCEG - Quality of Bathymetric Data.

The meeting noted the report.

3.9 Report from WWNWS-SC/S-124PT

EM (S-124PT Chair) reported that the S-124 Product Specification is intended for navigational warnings and is a technical component of e-Navigation and the modernization of GMDSS projects.

The meeting noted the S-124 report.

## 4. S-100 Edition 4.0.0 Proposals

4.1 Dataset Naming Convention for S-100

The Chair noted that this agenda item had been overtaken by events and was removed from the agenda.

4.2 Exchange Catalogue Naming for S-100

SS reported that at the 3rd S-100WG meeting, it was agreed that a common naming convention for the Exchange Catalogues should be defined. The current guidance in S-100 is not sufficient for consistent implementation across product specifications.

He proposed that catalogue information could be included in the filename and noted that the ".CAT" extension should be used rather than ".XML". Furthermore, the catalogue name should contain the name of the product (S-number) and could also include: the product specification; new editions; revisions; and clarifications. He questioned whether it is necessary to express all 3 levels (new edition, revision or clarification) and proposed that clarifying text should be included in S-100 Appendix 4A and chapter 10c.

The meeting noted the report.

HB noted that he is not in favour of putting too much meta information in the filename. This should be included within the file. He reported that there is no information about the exchange set catalogue schema. The Chair informed the meeting that they are available on the Github site. It was agreed that the schema should conform to the same schema (possibly in the same file) that will be in used in an S-100 based ECDIS. Furthermore, it was agreed that the schemas available on the Github site should be made available in the Registry.

DG agreed that it is not a good idea to have metadata in the filename and noted that the PS Edition number is available from the Feature Catalogue.

The meeting approved the continuation of this discussion by a small group to be led by PRIMAR (SS, EK, DG, TR, HP, JP, HB, LP), and report to the TSM7 meeting (September 2019).

***(Action: 01)***

4.3 Guidance on how to manage the urn:mrn:iho namespace

This agenda item was moved to item 6.4

4.4 Proposed clarification on masking

RM noted that while S-100 Part 10 makes provision for masking/truncation for spatial records, it's not fully described in the general feature model (GFM). He proposed that this should be added and guidance on how it should be implemented in the GML format, should be included. He noted that this does not require change to the masked spatial type field for the current ISO 8211 format description in Part 10A. HB noted that there was a slight difference in the model from what was presented – he will discuss this further offline with RM.

*Decision: All proposals were accepted by the meeting.*

4.5 S-100 Validation Checks

BC noted that, as part of the process of converting the S-58 for S-101 use, they had identified a subset of the checks that they consider to be sufficiently generic to be used at an S-100 level. He proposed that there should be a set of generic S-100 checks that would form the basis of more extensive product specific checks. Requested that a small task group should be formed to complete the list of generic S-100 checks. He noted that he had also been working with the DQWG and is awaiting their feedback. He requested that this work be taken over by someone else as the work is beyond his expertise.

RM reported that there is a requirement for establishing generic checks for GML and HTF5 encodings. It was decided that a breakout meeting would be formed to review the current work and to identify gaps.

A small breakout session was held during the meeting to review the work done by Denmark. The S-100WG will undertake the continued maintenance of the S-100 specific validation checks and report to the TSM on the next steps as to where the checks should be housed within S-100.

4.6 Catalogue CSS Files Proposal

DG reported that currently the style sheets file used to style the Scalable Vector Graphics symbols are not catalogued and proposed that the portrayal catalogue should be catalogued in the

portrayal_catalogue.xml file. The proposed changes would allow the style sheets to be explicitly catalogued in portrayal_catalogue.xml file.

*Decision: The proposed extension was accepted for inclusion in Edition 5.*

4.7 Palette Support for Symbols Proposal

DG proposed that a CSS attribute should be added to the “pallet type” and to “sample colour profile”. This will allow the Portrayal Catalogue’s SVG symbols to be rendered with the appropriate colours for the selected palette.

The proposed extension was accepted. HB noted that the pallets for day, dusk and night should be standardized. DG noted that this supports what is in S-100; it is not dependent on day, dusk or night and it supports any number of pallets. HP questioned whether there is a rule that states how many pallets there can be and noted that there should be a baseline of what pallets are allowed. EM noted that there has been some specification included in the draft S-98; and if further discussion is required this can be done in regard to the completion of S-98.

*Decision: Proposal was accepted for inclusion in S-100 Edition 5.*

4.8 Palette Item Transparency Proposal

DG noted that products such as S-102 and S-111 use transparency values which vary with the selected colour palette. Currently drawing instructions provide a single transparency value which applies regardless of the selected colour palette. In order to overcome this limitation, he proposed changes to allow colour token to optionally specify transparency.

*Decision: The proposal was accepted for inclusion in Edition 5 as a correction.*

4.9 Style Sheet Folder Proposal

DG noted that, Stylesheets must be applied to the SVG files in the "Symbols" folder, however they currently reside in the portrayal catalogue “ColorProfiles" folder. He proposed that this should be changed in S-100 Part 9, clause 9-13.2 portrayal library structure.

*Decision: The proposal was accepted by the meeting as a correction.*

4.10 ISO8211 DSC Proposal

DG reported that the ISO 8211, C2IT and C3IT data descriptive fields are incorrectly documented in S-100 Part 10a, clauses 10a-5.4.2 and 10a-5.4.3. He noted that datasets created using the current values shown in Part 10a will not load, and proposed that the indicated values should be changed to “1”.

*Decision: The proposal was accepted for inclusion in S-100 Edition 5.0.0 as a correction*.

4.11 Proposal for a review of the S-100 Exchange Set Model

YB invited the meeting to discuss whether the existing S-100 Exchange Set Model meets all the requirements for S-100 data distribution. He noted that KHOA plans to investigate the various scenarios for S-100 data distribution and will also conduct a gap analysis on the existing S-100 Exchange Set model. KHOA will report on the results at the next S-100WG meeting. If necessary, they will propose changes for inclusion in Edition 5.

HP requested this work should also consider the time cycles between updates for the different products, and how incremental updates can be implemented, noting the restrictions that apply to GML updates.

Canada noted that the NIPWG meeting proposed that S-128 could be used for testing incremental update mechanisms, and are doing some work in this regard.

***(Action: 02).***

4.12 HDF5 File Families

RM reported that some product specifications such as S-102 may use HDF5 "file families" to break up a HDF5 logical data file into several physical data files, however additional metadata would be required to support this. HP suggested that this added an additional layer of complexity, and recommended that it should not be implemented. HB proposed that it's not a bad idea to split files into smaller bits for transmission, however he did not agree with the structure of the metadata and suggested that it needs a review. DG proposed that there is no way to determine if file families are being used or not.

*Decision: The proposed extension for file families was not agreed. It was decided to forbid the use of file families in S-100 Part 10c unless otherwise needed.*

***(Action: 03)***

4.13 Miscellaneous Revisions

RM proposed changes to the exchange catalogue model in (App. 4a-D) reduces ambiguity in the meaning of the association between discovery metadata for dataset and support files.

Concerning Pro 1 – (Figure 4a-D-2 and Table), HB proposed that the model is correct and it's not necessary to change it. He proposed that this could be implemented by constricting the schema.

*Decision: The proposal was not accepted by the meeting.*

Proposal 2 Changes to Figure 4a-D-2 and Table needs further investigation for GML implementations.

*Decision: The proposal was not accepted by the meeting*.

*Decision: the meeting agreed that proposals 3 to 35 were all minor clarifications and should to be distributed by Working Group letter for approval in order to save time at the meeting.*

***(Action: 04)***

4.14 Miscellaneous Revisions for Gridded and HDF5

RM presented the proposal to define the location of data point in cell which would be an extensions for inclusion in S-100 Edition 5.0.0. Following a brief discussion, HA questioned whether there are any use cases for the proposed changes. HB proposed that all that is need for S-100 is "centre" and "corner".

*Decision: The meeting agreed that the proposal should be deferred until use cases (e.g. surface currents) could be identified.*

***(Actions: 05, 06)***

4.15 Feature Association Field Data Descriptive Field Update

SS reported that a clarification needs to be made to S-100 Part 10a, clause 10a-5.11.4 (Data Descriptive field) value APUI with FAUI to align descriptive field and table.

*Decision: The meeting agreed the proposed clarification.*

4.16 Footnote Clarification

Proposed clarification to Part 4a Table 4a 4 footnote, to include the missing footnote "i".

*Decision: The proposal was accepted however there is a need to find what the "i" is in the associated ISO document.*

4.17 Example Field Table using the DSID field update

Part 10a Table 10a-3.4 Field (Subfield names and Labels in example table do not exist in S-100 outside this example. To avoid confusion the example table should be replaced). HB commented that the table was just an example.

*Decision: The proposal was accepted by the meeting.*

## 5. S-98 Interoperability Specification

5.1 S-98 Interoperability Specification for S-100

The Chair noted that a large number of comments had been received in response to the S-98 review, and in order to save time, the meeting would only consider those comments that the Secretariat had disagreed with.

*Decision: Secretariat counter comments relating to; 1.3.2, 4.4.2.2, 4.8.2.1, 4.8.4.2, 5, 8.4.1, 10.2, 10.7.1 and 16.3 were all accepted by the meeting. Furthermore it was decided that 10.12.1 need improvements to the wording, the clause at 10.8 should be removed from the document and the third bullet point at 12.6.2 should be removed.*

The Chair reported that a white paper has been developed in response to the comments provided by SHOM.

EM presented the white paper on the functional principles. He noted that the interoperability specification is developed as a framework for capturing interoperability rules for use in ECDIS. The specification can be reused in any system using S-100 data.

YK (SHOM) expressed gratitude for the white paper, and question whether the S-102 data or any other products could override the bathymetry that is in the ENC. One of the major issues is to be sure that the mariner will understand how interoperability works and what the systems displays. S-98 and the white paper should include a mariner centric approach. The present version is too system centric.. HP proposed that the current document only considers the interoperability baseline. What data takes precedence under what circumstances, needs much higher level consideration and discussion, noting the immaturity of the current state of development of product specifications and their feature and portrayal catalogues. It was agreed to include minor edits and submit S-98 to HSSC11 for consideration as Edition 1.0.0.

***(Actions: 07, 08)***

## 6. S-100 General Topics

### 6.1 S-100 Technical Readiness Levels (TRLs)

The Chair noted that the intent of developing TRLs are to show the progression from an idea to regular use and proposed that the process mirrors the development of IHO product specifications from proposal to operational use.

HP proposed the currency level (up to dateness) needs to be recorded somewhere. AH (IALA) noted that there is an EU approach using validation and authentication – going from demonstration to use.

TR proposed that there should be some earlier levels, and questioned whether some of the levels should be included in Res 2/2007.

DB proposed to remove the links to PS edition numbers.

AK proposed that the process of developing should include an impact study as part of the process.

*Decision: The meeting endorsed the concept for submission to HSSC consideration and if approved; for inclusion into S-97.*

***(Action: 09)***

### 6.2 S-97 Product Specification Development Guidebook

The Chair noted that the document had been circulated for WG review and four pages of comments had been received. She questioned whether there was an appetite to consider all of the comments during the meeting or as a correspondence group.

JW technical comment questioning that only lower case characters can be used for the first character of enumeration id's was withdrawn after discussion.

DG noted that there were an issue with the FC concerning the use of feature and information type associations which will be discussed offline.

*Decision: It was agreed that the proposed editorial comments would be accepted and included in the document and the WG endorsed the document for Ed 1.0.0. (See associated actions)*

***(Actions: 10, 11)***

### 6.3 S-100 Infrastructure Development (KHOA)

YB reported on the current status of the S-100 infrastructure development which comprises of the GI Registry and the Feature Catalogue, the Portrayal Catalogue and the Data Classification and Encoding Guide builder applications.

The Change proposal of the S-100 part 2 submitted by KHOA that included the addition of a new Concept Register was noted by the meeting as a "work in progress", with additional input to be provided by the Registry manager (JW)

***(See Action: S-100WG3, Action 39)***

The chair thanked KHOA for undertaking this work and for their continued commitment to developing and supporting the S-100 infrastructure.

6.4 Marine Resource Naming (MRN) Guidance for S-97

EM reported that MRN concept provides a powerful mechanism for generating globally unique identifiers and recommended that a governing body should be established to take responsibility for the management of the IHO MRN domain. He proposed that the Secretariat be tasked with managing the domain on behalf of IHO noting that this would require the establishment of a public location for publishing the designated MRN namespaces for their discovery and use.

He noted that the camelCase GUID structure in the Registry creates uncertainty as to how an MRN structure should be defined and questioned how MRN's will be structured for different domains. He also proposed that using MRN for the feature concepts in the GI Registry be delayed till a later time when more consideration can be given to the issue.

He proposed to consider linking ONSIDs with S-62, e.g. no organization gets an OSNID unless they already have an S-62 ID.

HB noted that it appeared that MRN use is limited to objects only and proposed that they could be used for anything, although there may be some problems for cross product identification. He noted that it needs to be clear, who will assign the id in such cases.

DG pointed out that all reference to "bytes" should be changed to "character length". IALA noted that they supported that proposal.

The Chair reminded the meeting that this is still a draft paper, and proposed that IHO and IALA should work on developing a draft guideline document for consideration by the next meeting.

IALA noted that they have developed two associated documents; one on the administration of namespaces and the second on their implementation.

The meeting noted the progress on this draft document.

***(Action: 12)***

6.5 Proposal to create a new ENC Distribution Protocol

YW (MSA) reported that they would like to propose a way to make a selection of their ENC dataset from different supply sources based on "comparative shopping" principles. Following some tests, it became evident that existing ENC related standards do not make provision for an ENC subscription service, and they would like to propose that this is considered for S-100 products.

YW noted that the two main issues were that data service providers (DSP) systems have to integrate ENC cells and permits from different DSPs; and these have to be combined into one installation package. There are cases where agents are able to provide users with a unified and simple ENC subscription interface, and order S-63 encrypted ENC from different DSPs for the users.

He proposed that the WG should consider establishing a standard for ENC subscription. When updating the S-100 security, consideration should also be given to the need to include datasets from different providers into a single distribution.

HP – noted that the paper should be for consideration by the S-101PT. Primar and SevenCs both regarded this is not in the scope of S-100WG.

*Decision: The meeting noted the report and agreed that product specification development activities should give consideration that they do not inhibit data distribution practices.*

***(Actions: 13,14)***

6.6 Optimisation of the conversion of S-57 data to S-101

EK reported on the work task to compare the S-57 UoC with the current version of the S-101 DCEG. The methodology used was to examine all instances where "real world features" were equivalently encoded features in S-57 and S-101 and if required, what transformation process should be applied in order to produce S-101 ENC data.

They concluded that the converter application is robust and works well, but without any validation tools it is difficult to confirm that the output is equivalent to the S-101 ENC Production Tool. He noted that the main problem encountered was with converting the S-57 INFORM attribute.

The meeting noted the document and the reported usefulness of machine readable catalogues for specifying S-10x data.

HB reported that the latest edition of SevenCs validation software also validates against S-101 datasets.

RF requested the meeting to consider what changes can be made to current encoding practices to aid the (S-57 to S-101) conversion process. He cited the example of aggregations.

*Decision: The meeting noted the report and agreed that it should be submitted to HSSC11 for information and to the S-101 Project Team and ENCWG for action.*

***(Action: 15)***

6.7 Proposal for defining S-100 Compliancy Levels

EM reported that action 23 from the 3rd WG meeting called for a review of S-100 compliance levels and proposed solutions for inclusion in Edition 5. He emphasised that S-100 compliance is not the same as ECDIS compliance. He noted that the following levels of compliance are under consideration: object model; standard and non-standard encoding; and IMO harmonized display. Furthermore, he recommended that when the alerts and indications concept and the Interoperability Catalogue are sufficiently mature, they should both be added to the 4th level compliance.

HP requested that the term "categories" should be used (rather that levels) so as not to confuse with the technical levels proposed in paper 6.1.

*Decision: The meeting approved the inclusion of compliance levels for inclusion in Edition 5 of S-100.*

***(Action: 16).***

6.8 S-100 Data Services via SMART Navigation Platform

YB introduced the Korean SMART navigation project which is based on proposed S-100 product specifications for non-SOLAS vessels by 2021. It will include S-101 Electronic Navigational Chart (ENC), S-102 Bathymetric Surface, S-104 Water Level Information for Surface Navigation, S-111 Surface Currents, S-122 Marine Protected Areas (MPAs), S-123 Marine Radio Services, S-124 Navigational Warnings and S-127 Marine Traffic Management.

KHOA offered to draft the S-100 Test Data Sets and portrayal catalogue as part of their 2019 research project. They will also study how to improve S-101 symbols with other S-100 based data sets for non-SOLAS ships.

The meeting noted the paper.

6.9 Update on S-100 Portrayal Catalogue Builder

SO reported on the progress made on the revision to the S-100 Portrayal Catalogue Builder, and noted that this had also been reported during the GI Registry Workshop.

The meeting noted the paper.

6.10 Conversion of S-57 Test/Validation data to S-101

TP reported the paper is actually resulting from some tests carried out by Dr Heeyoon Park (KHOA) who is on attachment to the IHO Secretariat. The paper, which will be submitted to the S-101PT meeting, raises some issues about the test and validation datasets that have been developed for S-57. He noted that the S-101PT will need to consider what test datasets will be required for testing portrayal, type approval and data validation; and invited the meeting to take note of the large numbers of test dataset files that had been produced for S-57 ENCs and ECDIS that may need to be converted for S-101 purposes.

The meeting noted the paper.

6.11 Roles and Association Management by S-100 FCB

YB reported on the management process for feature associations and roles. This was an action from the 3rd S-100WG meeting. He reported that the tools have now been implemented in the S-100 Feature Catalogue Builder and the management process has been changed to make provision for the registration or modifications of items required by S-10X Product Specifications.

The meeting noted the paper.

6.12 Progress Report on S-101 Feature Catalogue 1.0.0

YB reported that the S-101 Feature Catalogue and the creation of the DCEG 1.0.0 Builder. KHOA will be conducting tests on these applications and will report the results of the next (S-100WG5) meeting. KHOA is planning to release the official version of the S-101 FC 1.0.0 in May 2019.

YB invited WG members to review the latest edition of the revised S-101 DCEG documents generated from the application and provide feedback to him.

6.13 S-100 GI Registry Updates and Plan for 3rd Registry

YB reported on the development of the beta version of the 3rd S-100 GI Registry application. It includes additional registers such as a concept register and test bed registers. He requested WGs to review the new Registry functions and report any issues to him. He noted that there were still some issues to sort out concerning the Registry roles, and how to confirm the authenticity of applications.

JW provided a report on the activities and current status of the IHO GI Registry; and a report on the discussions that took place at the 1st GI Registry Workshop that preceded the S-100WG4 meeting. He proposed that the fundamental conventions for the format and syntax of the content of the Concept Register (to be included in the draft S-99 Annex A) be endorsed by the WG.

*Decision: The meeting endorsed the conventions that were developed during the Registry Workshop.*

## 7. S-100 Project Team Reports and Proposals

7.1 S-102 Report

DB reported that the was a problem with the last edition of S-102 resulting from trying to align with S-100 Edition 4, which had not be completed. Noted the S-102 PT will be registering "Depth." Two versions of the BAG to S-102 converters have been developed and are available for download. Once all of the comments have been included, the document will be sent out for review and then submitted.

*Decision: The WG endorsed the proposed way forward and submission to HSSC for endorsement.*

***(Action: 17)***

7.2 S-121 Report

The Chair reported that HSSC10 delegated the approval of S-121 Edition 1.0.0 to the S100WG, pending that certain conditions were met. The primary condition was that the Product Specification documents had to be completed, including: the registration of the features and attributes; the creation of a feature catalogue; and that the resultant documents should be distributed for comment by the S100WG. S-121PT submitted the revised documents too late for consideration by the WG at this meeting.

The Chair noted that, due to the late submission from the S-121PT for consideration by the meeting, there was insufficient time for the WG members to properly review the Product Specification documents and provide comment. It was decided that the S-100WG Chair will issue a letter asking for Working Group comments, which will be due by 20th June. After the S-121 Project Team adjudicates the comments received from the S-100WG members, S-121 will follow the HSSC endorsement process to publication of an Edition 1.0.0 version for implementation and testing.

The meeting the noted the report.

***(Action: 18)***

7.3 S-129 Report

NL reported that S-129 enables encoding of the extent and nature of UKCM information products. He highlighted a number of issues that need to be resolved; and subject to these not being showstoppers the S-100WG will be requested to approve S-129 Edition 1.0.0 for consideration by HSSC. The meeting noted the issues presented by the PT and endorsed the proposed work schedule and way forward for portrayal.

Concerning the following questions:
- Should the term 'dataset' and 'data product' be used within the PS? The meeting agreed that "dataset" should be used.
- The use of units of measure? The current use in the document is correct.
- Enumeration values –Annex C –C.4.1 and C.4.2 -p75? The type is "enumeration".
- S-100 WG to advise if Annex E issues needs to be changed before the PS can be made version 1.0.0? It was agreed that this is not a show stopper.

*Decision: The meeting endorsed submission of S-129 Edition 1.0.0 to HSSC11 under the terms of the new dispensation.*

***(Action: 19)***

7.4 S-101 Report

AA reported that new modular approach recently approved by HSSC for PS development has benefited the development of the S-101 PS. S-101PT had met in Monaco in June 2018 and was able to make significant progress on several issues. Edition 1.0.0 was published in December 2018 for implementation and testing. The PT plan to produce an interim Edition 1.1.0 to take account of a few additional items. It is anticipated that Edition 2.0.0 will include more complex items and is currently planned be completed in December 2020.

The meeting noted the report.

7.5 S-124 Report

EM reported that improvements to the S-124 data model had been made. The lessons learned from e-Navigation test-bed projects had provided valuable input. The WWNWS Sub-WG have decided that Temporary and Preliminary Notices to Mariners are not within the scope of S-124, and these have been removed from the data model and GML schema. Sweden is drafting a technical service description of a Navigational Warning service based on the IALA model. The document will be distributed when complete.

The meeting noted the report.

## 8. S-100 Test Bed Reports

8.1 S-100 Test Bed Reporting Template

JP introduced the draft template for documenting reports of S-100 based product specifications. She noted that it needed further work and invited WG members to contribute to the document, especially those who have carried out test bed projects.

The meeting noted the report.

8.2 SPAWAR Test Bed Report

DG reported that the primary purpose for the test bed was to identify gaps in utilization of the S-100 family of product specifications with initial focus on S-100 and S-101. This will be extended to include GML and HDF-5 encodings in future. DG invited the meeting to consider following issues resulting from their test bed activities.

***(Actions: 20 to 27).***

8.3 Ship simulator based S-100 Test System

SO reported that KHOA has been developing an S-100 Viewer and S-100 shore based ECDIS to verify the quality and usability of S-100 data. The prototype system includes both an S-100 ship handling simulator which is also equipped with an S-57 based ECDIS. The results from the test bed will be reported to the next S-100WG meeting. He invited interested expert to comment on the plan.

The meeting noted the report.

8.4 KHOA S-100 Test-bed Project

SO reported that KHOA next S-100 Test-bed project will include a Phase 3 (Simple Viewer) and Phase 6 (shore-based ECDIS) test-bed applications. While developing the Phase 3 component, tests will be carried out to test S-100 catalogues.

The meeting noted the report.

## 9. External Liaison Reports

9.1 ISO/TC211

TP reported that the ISO/TC211 standards went through a regular review cycle, and reported on a number of standards that were either undergoing systematic review or planned for review. He also reminded the meeting of the various resources that were made available for standards development. These included UML models, XML schema and a multi-lingual glossary of terms. He also reported that TC211 had developed a registry of geodetic codes and parameters, however this was not yet online.

The meeting noted the report.

9.2 OGC

JP reported on behalf of Jonathan Pritchard, who was not able to attend the meeting. The OGC Marine Domain Working Group (MDWG) has met 4 times in 2018 in conjunction with OGC Technical Committee meetings. The OGC MDWG have engaged with the OGC Semantic web community to research the modelling of concepts within the IHO Geospatial Information Registry and to explore the potential for interoperability outside prime use cases of S-100 data. She noted that OGC have invited S-100WG members to participate in OGC activities to increase marine representation in the OGC community and proposed that this involvement could be coordinated through the OGC MDWG activities. Other items of note included the S-121 pilot project and GEBCO Seabed 2030 project.

The meeting noted the report.

9.3 IEC

HP reported that the IEC S-421 Route Exchange Product specification format (IEC number 63173) has been approved as Committee Draft (CD). It is expected that it will be published as a standard in early 2020. He reported that Sweden had submitted a new work item proposal for shore infrastructure. YB informed that the IEC domain has been created and is ready item proposal in support of their Product Specifications. HP reported that this will be done when the modelling and document steps are sufficiently mature.

The meeting noted the report.

9.4 IEHG

DID reported no significant developments had been made since the last S-100WG meeting, as the IEHG was awaiting the publication of S-101 Ed. 1.0.0. The group will have their next meeting in October 2019, and some of the key topics to be discussed include IENC change requests and IENC 2.5 relation to S-401. She noted that the IEHG intend to leverage the S-101 Feature Catalogue as a starting point for their S-401 Feature Catalogue. This will include making use of the Feature Catalogue Builder and DCEG Builder applications. The IEHG also plans to use S-101 symbols where possible and register all inland specific symbols within their inland ENC portrayal domain.

The meeting noted the report.

9.5 WMO/JCOM

No paper.

## 11. Review of Meeting Actions

The meeting reviewed the list of actions which are included as Annex A.

## 12. Date and Venue of Next Meeting

The Chair noted that there had been no offers to host the meeting. She requested members to discuss this with their home offices and consider hosting the meeting sometime in February or March in 2020.

## 13. Close of Meeting

The Chair thanked the Danish Geodata Agency for hosting the meeting and for their warm hospitality and excellent logistical support. She thanked all Working Group members for their participation and their contributions to the IHO standards development activities, and wished all a safe trip home.

**Annex A**

# List of Actions

| S-100WG4 – Aalborg, Denmark (27 Feb -1 Mar 2019) | | | | |
|---|---|---|---|---|
| **Action Items** | | | | |
| **No.** | **Item** | **Action** | **Who** | **Status** |
| 1 | 4.2 | Investigate how best to structure exchange catalogues for the distributing different Product Specification datasets, (as part of an exchange set) for TSM7. Also include the schemas in the Github site on the Registry. | PRIMAR, EK, IC-ENC, HP, HB, CHS, NOAA, Brazil, JW | |
| 2 | 4.11 | Based on KHOA's tests on the S-100 exchange set model, provide recommendations on improving the model. For consideration at the next S-100WG meeting. | KHOA, PRIMAR, NOAA, IIC, Teledyne CARIS | |
| 3 | 4.12 | Noting the comments on the HDF5 encoding (paper 5.12), develop a revised proposal that includes guidance on the use of file families in S-100 Part 10c – i.e. under which circumstances their use should be allowed. For TSM7. | RM | |
| 4 | 4.13 | Circulate the minor clarifications in paper 4.13, (proposals 3 to 35), to the Working Group via S-100WG letter for approval. | Chair | |
| 5 | 4.14 | Noting the discussion on HDF5, request additional information from the Surface Current PT on their requirements, and resubmit the proposal if required. | RM | |
| 6 | 4.14 | Provide the clarifications presented in paper 4.14 that were accepted by the meeting, to the Secretariat (TSSO) as a separate document, for inclusion in the document redline. | RM | |
| 7 | 5.1 | Include the comments (agreed at S-100WG4) into the S-98 document. When completed, submit to document to HSSC11 as Edition 1.0.0 for approval. | Chair | |
| 8 | 5.1 | Investigate the description of pick reports in S98. | EM, HA, HB, RF | |
| 9 | 6.1 | Noting the comments on Technical Readiness levels paper, submit a revised paper to HSSC11, recommending that its content be included in S-97, and proposing that the S-100WG should develop a compliance scheme. | Chair | |
| 10 | 6.2 | Submit the updated S-97 document to HSSC11 for consideration. Recommend to HSSC that it be approved as Edition 1.0.0. for testing. | Chair | |
| 11 | 6.2 | Noting the agreement of the meeting on the withdrawal of the only technical comment that was submitted under paper 6.2, include all the editorial comments into the S-97 document. | JW | Complete |
| 12 | 6.4 | Provide all comments (by March 22) received on the MRN concept (paper 6.4) to EM and (in collaboration with the IHO Secretariat), draft a joint guideline document, taking into account the two documents already under development by IALA. | EM, DL, JW | |

| | | | | |
|---|---|---|---|---|
| 13 | 6.5 | Noting the issues raised in paper 6.5 on ENC distribution protocols, the S-100 WG Chair is to propose to HSSC11, that all WGs should monitor their Product Specification development activities to ensure the they do not inhibit data distribution practices. | Chair | |
| 14 | 6.5 | The proposal to create a new ENC distribution protocol to be presented to the ENCWG and S-101PT. | China (MSA) | |
| 15 | 6.6 | Submit the report on the status of S-57 to S-101 conversion to S-101PT and ENCWG for consideration and submit to HSSC11 for information. | Chair | |
| 16 | 6.7 | Draft a proposals on S-100 compliance levels (based on paper 6.7) for inclusion in S-100 Ed 5. To be presented to the TSM7. | HP, DG, EM | |
| 17 | 7.1 | Submit the S-102 Edition 2.0.0 to HSSC11 for endorsement. | Chair | |
| 18 | 7.2 | Circulate the latest S-121 PS documents and invite comments from the S100WG (20th June). | Chair | |
| 19 | 7.3 | Submit the S-129 Edition 1.0.0 Product Specification to HSSC11 for approval. | Chair | |
| 20 | 8.2 | Develop a proposal to address the inconsistencies between the portrayal catalogue schema (Part 9-A-5) and the S-100 UML diagram (Figure 9-20 and table 9-13.3.1) with regard to the name for Display Planes - for consideration at TSM7. | SPARWAR | |
| 21 | 8.2 | SPAWAR to provide a C++ reference implementation of an S-100 Part 9a/Part 13 interpreter. | SPAWAR | |
| 22 | 8.2 | Noting the typo issues highlighted in paper 8.2, propose any other portrayal schema items identified - for consideration at TSM7. | SPAWAR | |
| 23 | 8.2 | Prepare change proposal forms for items relating to “endOffset” – for discussion at TSM7 SPAWAR. | SPAWAR | |
| 24 | 8.2 | Prepare paper for Symbol / Viewing Group dependencies for consideration at TSM7. | SPAWAR | |
| 25 | 8.2 | Provide guidance on the use of Positioning Centred Symbols - for consideration at TSM7. | All | |
| 26 | 8.2 | Resolve the issues relating to Light Sector Extension and provide recommendations to the S-101PT. | SPAWAR | |
| 27 | 8.2 | Address, issues identified with S-100 Part 9 Portrayal to ensure that time series data is able to be represented without product specific rules. This should dovetail with implementation of Date Dependent portrayal. For consideration at TSM7. | SPAWAR | |

**Annex B**

## Agenda

| Document Number Prefix | Agenda Item | Agenda Item / Document Title | |
|---|---|---|---|
| 1. Opening and Administrative Arrangements | | | [Powell] |
| S100WG4 | 1.1 | List of Documents | |
| S100WG4 | 1.2 | List of Members and List of Participants | |
| S100WG4 | 1.3 | S-100WG ToRs | |
| 2. Approval of Agenda | | | [Powell] |
| S100WG4 | 2.1 | Agenda | |
| 3. Matters Arising and HSSC Working Group Reports | | | [Powell] |
| S100WG4 | 3.1 | Approval of S-100WG3 Minutes | [Powell] |
| S100WG4 | 3.2 | Review of S-100WG3 Actions | [Powell] |
| S100WG4 | 3.3 | HSSC10 Report | [Powell] |
| S100WG4 | 3.4 | HSSC Actions | [Powell] |
| S100WG4 | 3.5 | ENCWG Report | [] |
| S100WG4 | 3.6 | NCWG Report | [Hovi] |
| S100WG4 | 3.7 | NIPWG Activities | [NIPWG] |
| S100WG4 | 3.8 | DQWG Report | [] |
| S100WG4 | 3.9 | Report from WWNWS-SC/S-124PT | [Mong] |
| 4. S-100 Proposals | | | [Powell] |
| S100WG4 | 4.1 | Dataset Naming Convention for S-100 | [Powell] |
| S100WG4 | 4.2 | Exchange Catalogue Naming for S-100 | [Norway] |
| S100WG4 | 4.3 | Guidance on how to manage the urn:mrn:iho namespace (moved to item 6.4) | [Mong] |
| S100WG4 | 4.4 | Proposed clarification on masking | [Malyankar] |
| S100WG4 | 4.5 | S-100 Validation Checks | [Cardoso] |
| S100WG4 | 4.6 | Catalogue CSS Files Proposal | [Grant] |
| S100WG4 | 4.7 | Palette Support For Symbols Proposal | [Grant] |
| S100WG4 | 4.8 | Palette Item Transparency Proposal | [Grant] |
| S100WG4 | 4.9 | Style Sheet Folder Proposal | [Grant] |
| S100WG4 | 4.10 | ISO8211 DSC Proposal | [Grant] |
| S100WG4 | 4.11 | Proposal for a review of the S-100 Exchange Set Model | [Yong] |
| S100WG4 | 4.12 | HDF5 File Families | [RM] |
| S100WG4 | 4.13 | Miscellaneous revision proposal | [RM] |
| S100WG4 | 4.14 | Miscellaneous Revisions for Gridded and HDF5 | [RM] |
| S100WG4 | 4.15 | Feature Association Field Data Descriptive Field Update | [Skjaeveland] |
| S100WG4 | 4.16 | Recommended Metadata for Geographic Datasets footnote Correction | [Skjaeveland] |
| S100WG4 | 4.17 | Example Field Table using the DSID field update | [Skjaeveland] |

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| 5. S-98 Interoperability Specification | | | [Powell] |
| S100WG4 | 5.1 | S-98 Interoperability Specification for S-100 | [Powell] |
| 6. S-100 General Topics | | | [Powell] |
| S100WG4 | 6.1 | S-100 Technical Readiness Levels | [Powell] |
| S100WG4 | 6.2 | S-97 Product Specification Development Guidebook | [Powell] |
| S100WG4 | 6.3 | S-100 Infrastructure Development (KHOA) | [] |
| S100WG4 | 6.4 | Marine Resource Naming Guidance for S-97 | [Powell] |
| S100WG4 | 6.5 | Proposal to create a new ENC distribution protocol | [ Yuxiao] |
| S100WG4 | 6.6 | Optimization of the conversion of S-57 data to S-101 | [??] |
| S100WG4 | 6.7 | Proposal for defining S-100 Compliancy Levels | [Mong] |
| S100WG4 | 6.8 | S-100 Data Services via SMART Navigation Platform | [Baek] |
| S100WG4 | 6.9 | Update on S-100 Portrayal Catalogue Builder | [Baek] |
| S100WG4 | 6.10 | Conversion of S-57 Test/Validation data to S-101 | [Pharaoh] |
| S100WG4 | 6.11 | Roles and Association Management by S-100 FCB | [Baek] |
| S100WG4 | 6.12 | Progress Report on S-101 Feature Catalogue 1.0.0 | [Baek] |
| S100WG4 | 6.13 | S-100 GI Registry Updates and Plan for 3rd Registry | [Baek] |
| 7. S-100 Project Team Reports and Proposals | | | [Powell] |
| S100WG4 | 7.1 | S-102 | [Brazier] |
| S100WG4 | 7.2 | S-121 | [Kuwalek] |
| S100WG4 | 7.3 | S-129 | [Powell] |
| S100WG4 | 7.4 | S-101 | [Armstrong] |
| S100WG4 | 7.5 | S-124 | [Mong] |
| 8. S-100 Test Bed Reports | | | |
| S100WG4 | 8.1 | S-100 Test Bed Reporting Template | [Powell] |
| S100WG4 | 8.2 | SPAWAR Test Bed Report | [Grant] |
| S100WG4 | 8.3 | Ship simulator based S-100 Test System | [Baek] |
| S100WG4 | 8.4 | KHOA Test bed Report | [Baek] |
| 9. External Liaison Reports | | | [Powell] |
| S100WG4 | 9.1 | ISO | [Pharaoh] |
| S100WG4 | 9.2 | OGC | [Kuwalek] |
| S100WG4 | 9.3 | IEC | [Peiponen] |
| S100WG4 | 9.4 | IEHG | [LaDue] |
| S100WG4 | 9.5 | WMO – JCOMM | [] |
| 10. Any Other Business | | | [Powell] |
| S100WG4 | 10.1 | | [] |
| 11. Review of Meeting Actions | | | [Powell] |
| 12. Date and Venue of Next Meeting | | | [Powell] |
| 13. Close of Meeting | | | [Powell] |

**Annex C**

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