

**5th S-100 Working Group (S-100WG) Meeting
Taunton, United Kingdom (3 - 6 March 2020)
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:

JG	Jose CELSO C GONCALVES JR	HN	Hazel NEWMAN
LP	Lynn PATTERSON	PU	Peter UNDERWOOD
EM	Eivind MONG	AA	AI ARMSTRONG
MS	Matias SIFON	JC	Joshua CLAYTON
EH	Elizabeth HAHESSY	DL	David LEWALD
BC	Bruno CARDOSO	CW	Craig WINN
RF	Richard FOWLE	MS	Miroslav STAMENKOVICH
MR	Mikus RANKA	HF	Hillary FORT
MH	Mikko HOVI	DB	David BRAZIER
YK	Yann KERAMOAL	CHAIR	Julia POWELL
JV	Jana VETTER	HP	Hannu PEIPONEN
JR	Jochen RITTERBUSCH	DID	Denise LADUE
MP	Mathias PALM	IF	Inga FJELLANGER
MQA	Mohammad QISTHI AMARONA	MC	Matthew CLOSE
VP	Valentino PALMA	EW	Edward Weaver
TK	Takayuki KAWAI	GgV	Jarl gaute VARTDAL
TH	Tomonori HATTORI	JP	Jonathan Pritchard
AM	Arno MEURINK	AP	Anthony PHARAOH
RB	Rogier BROEKMAN	AK	Abri KAMPFER
OAF	Odd Aage FOERE	JW	Jeff WOOTTON
RS	Robert SANDVIK	TdP	Tom DE PUYT
PS	Paula SANCHES	HB	Holger BOTHIEN
YB	Yong BAEK (online)	SM	Susan MARKS
LD	Lucian DUTU	SS	Svein SKJAEVELAND
AL	Andrei LUCACI	EK	Edward KUWALEK
JMB	José María BUSTAMANTE	JMB	Julius MOELLER
HE	Hans ENGBERG	DK	Dongwoo KANG
CW	Christine WALDER	TR	Tom RICHARDSON
NG	Nick GIBBONS	GY	Gyeonghun Yim

1. Opening and Administrative Arrangements

The Chair Julia Powell welcomed participants to the meeting and reported that due to COVID 19 related travel restriction, members from the Rep of Korea, China and some industry experts were not able to attend the meeting. She expressed her appreciation to the UKHO for hosting the meeting and for their warm welcome.

Clair Lain (UKHO Head of International Relations) noted that she was very pleased to see such a good turnout and reported that the UKHO will be putting greater emphasis of the development of S-100 Standard and associated product specifications.

IHO Technical Director Abri Kampfer highlighted the importance of the responsibilities of the Working Group. He commended the quantity and quality of papers submitted by both Member States and Industry experts. He expresses his regrets for those members who were not able to attend and thanked the UKHO for hosting the meeting and their warm hospitality.

The Chair reported that the Vice Chair (Yong BAEK - KHOA) would be joining the IHO Secretariat in July and will therefore have to step down and invited nomination for this position. Elizabeth HAHESSY, being the only nomination, was elected as Vice Chair.

Abri Kampfer, to address the meeting impressed by the quantity and quality of papers – that need members for the industry participation and contribution – especially industry contribution. Noted those who were not able to attend -- Thanked the UKHO for hosting the meeting – and

2. Approval of Agenda

The meeting approved the agenda with some minor changes. Due to the large number of substantive proposals, it was agreed that WG reports be moved to end of the meeting.

3. Matters Arising and HSSC Working Group Reports

3.1 Approval of S-100WG4 Minutes

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

Chair reported that for historical reasons some of the S-100WG Project Teams which had not Terms of reference. ToR had been developed for these and will be submit to the next HSSC

3.2 Review of S-100WG3 Actions

The Chair reviewed the list of actions from previous meetings:

S-100WG4 – Aalborg, Denmark (27 Feb -1 Mar 2019)				
Action Items				
N o.	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	PRIMAR, EK, IC-ENC, HP, HB, CHS, NOAA, Brazil	Completed 4.7, 4.8, 4.9

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	Completed 4.7, 4.8, 4.9 6.7
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	Completed – see paper S-100WG5-4.20
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	Complete L2-2019
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	Completed see paper 4.21
6	4.14	<p>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.</p> <p><i>Email from Raphael (26 Feb) - Hi Julia,</i></p> <p><i>The three attachments address Actions 3, 5, and 6 from S-100 WG4 and are revised versions of items 4.12 and 4.14 from WG4. I have split S100WG4_4.14 into two, addressing actions 5 & 6 respectively. I have also removed all the proposed revisions to Part 8 from both proposals, anticipating that they will be rolled into the proposed holistic review of imagery & gridded data in S-100.</i></p> <p><i>I believe Jeff has already applied most of the clarifications in Action 6 to S-100, but the S-111 team wanted a minor change; also, assuming the NOAA proposal in WG5 for a new data coding format is accepted there will be an additional row for dcf=8 for the table in Action6. I still have to prepare or obtain an updated Figure 10c-9 for Action6.</i></p> <p><i>So, status of Actions 3, 5, 6:</i></p> <p><i>Action 3: Completed</i></p> <p><i>Action 5: Completed</i></p> <p><i>Action 6: Ongoing, 75% complete.</i></p>	RM	Almost completed see paper 4.22
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	Overtaken by events.
8	5.1	Investigate the description of pick reports in S98.	EM, HA, HB, RF	Complete
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	Complete 6.4
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	Completed – additional readability 6.4

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	Ongoing To be presented to the next S-100WG meeting
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 they do not inhibit data distribution practices.	Chair	Completed
14	6.5	The proposal to create a new ENC distribution protocol to be presented to the ENCWG and S-101PT.	China (MSA)	Completed
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	Completed
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	Completed 4.16
17	7.1	Submit the S-102 Edition 2.0.0 to HSSC11 for endorsement.	Chair	Completed Published
18	7.2	Circulate the latest S-121 PS documents and invite comments from the S100WG (20 th June).	Chair	Completed
19	7.3	Submit the S-129 Edition 1.0.0 Product Specification to HSSC11 for approval.	Chair	Completed
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	Completed 4.4
21	8.2	SPAWAR to provide a C++ reference implementation of an S-100 Part 9a/Part 13 interpreter.	SPAWAR	Completed
22	8.2	Noting the typo issues highlighted in paper 8.2, propose any other portrayal schema items identified - for consideration at TSM7.	SPAWAR	Completed
23	8.2	Prepare change proposal forms for items relating to "endOffset" – for discussion at TSM7 SPAWAR.	SPAWAR	Completed
24	8.2	Prepare paper for Symbol / Viewing Group dependencies for consideration at TSM7.	SPAWAR	Completed
25	8.2	Provide guidance on the use of Positioning Centred Symbols - for consideration at TSM7.	All	Completed
26	8.2	Resolve the issues relating to Light Sector Extension and provide recommendations to the S-101PT.	SPAWAR	Ongoing Paper has been produced

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	Complete
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Actions and Decisions from TSM 7 Meeting

Paper	Action	Who	Status
4.2	Establish a sub-working group to produce a functional analysis of related products (from the mariner perspective) in order to define the operating principles governing S-100 ECDIS and to ensure that S-100 products and S-98 are consistent with the overall vision of the implementation strategy for S-100.	France lead UK, IIC, Denmark, US-NOAA, KHOA, Italy	Ongoing
4.3	Report to the S-124CG that the TSM7 meeting considered that, when used in ECDIS S-124 data should be stacked as an overlay.	EM	Ongoing No meeting yet
4.5	Circulate the items relating to Portrayal Harmonization in S-98 (TSM4.5) for wider review and comment, and present feedback to the S-100WG5.	EM / Chair	Completed - 5.1D
4.7	Prepare a revised S-100 part to include the functional overview and use cases for S-98.	Chair	Completed - 5.1
5.1	Develop a more comprehensive proposal on S-101 Display Scale for consideration at S-100WG5	USA	Overtaken by Events Worked out an interpretation of S-101 that allows the US to compile to binary scales but set its display scale to S-101 values
5.2	Complete the alerts model and documentation for presentation, discussion and acceptance at S-100WG5. Check that all S-52 alarms and indications are included. Include a draft a "user story" showing the changes required to the Registry infrastructure.	NIWC	Completed – See paper 4.4
5.2	Investigate how to portray a safety depth contour from a navigational (S-102) coverage. What changes will be required in S-100?	NIWC, DQWG	Ongoing
5.2	Part 9 needs to be extended to derive a line from a coverage	NIWC	Ongoing (for Ed 6)
5.2	Include the mapping between the alert and the feature type.	NIWC	Ongoing (for Ed 6)
5.2	Investigate what needs to be added to the portrayal catalogue builder to cater for building the alerts and indicator catalogue (a user story).	NIWC	Completed. See 4.4
5.4	<i>Decision: Need to check that all the alarms and indications that are currently included in S-52; are included in the xml scheme for the Alerts and Indications catalogue</i>	S-101WG Chair	Ongoing

5.4	Submit a proposal on how to close the capability gaps in the S-100 portrayal model (for discussion/acceptance at the S-100WG5 meeting) and for inclusion in S-100 Edition.	[NIWC, HB, HP	Completed Se 4.11
5.4	Determine next actions for addressing dynamic portrayal and provide feedback on the recommended changes.	NIWC	Ongoing
5.6	Establish a small expert group to propose the necessary changes based on testing results presented in paper 5.6 (HDF5 inconsistencies)	HB, DG, DB	Comment paper to be submitted to S-102PT
	Input a comment sheet that includes the S-102 comment and propose the agreed changes as part of their input to the S-102 review - (review closing date 3 October).	HB, DB	Completed
5.7	Prepare change forms to implement Machine Readability of Display Plane Ordering and present to the next S-100 Working Group meeting. There should be one proposal for S-100 and one for S-98.	NIWC	Completed
5.8	Prepare change proposal submission to implement the "S100_PR_ContextParameter" proposal for consideration at the S-100WG5 meeting.	NIWC	Deferred
5.9	Investing implementing the recommendations 1 to 4 in NIWC paper. For recommendations 2 and 3; submit change a change proposal for next meeting. Recommendations 1 and 4 may be proposed at a later time.	T-Caris Seven seas, KHOA, NIWC	Deferred
5.11	Proposed changes to S-100 Part 4a were accepted and are to be implemented in S-100 Ed5	TSSO	Ongoing
5.12	Submit a change proposal form for the proposed changes to the exchange catalogue structure.	[PRIMAR]	Completed
5.13	Propose to replace the mechanism cancelling a datasets in the S-102 PS. To be done as part of the US comments on the IHO CL requesting review.	DB	Completed
5.13	Develop general guidance paper on how to managing dataset cancellation and dataset withdrawal for consideration at S-100WG5 and possible inclusion in S-100 Edition 5.		Completed
5.15	Submit a change proposal for the issues identified in paper TSM 5.15 (dealing with enhancements to S-100 Part 15) for consideration at the S-100WG5 meeting. (TSSO to provide Word version of S-100 Part 15 to Primar).	[Primar, IC-ENC, IIC-(JP)]	S-100 Part 15 Enhancements
5.16	Full proposal on Signature and Certificate to be developed and submitted to S-100WG5 for inclusion in S-100 Edition 5.		
5.17	Submit a change proposal for the proposed amendments to HDF5 encoding as described in paper S-100TSM 5.17 (inclusion in S-100 Ed 5)	TWLWG	Completed

5.19	Report the issues on the exchange set gaps to the full S-100WG with a view to forming a correspondence group to work on creating a new S-100 part. This is for S-100 Edition 6, and should include the proposals in paper TSM_5.19. It was agreed to get the minor proposals in paper 5.12 and 5.13 for inclusion in Edition 5.0.0 NOAA to lead the sub group on exchange set gaps,	(NOAA lead) SS, EM, DG, RM, EK, KHOA, NAVO, IC-ENC	Completed
7.1A	Based on the meeting discussion on IMO performance standard, provide an updated version of 7.1A to D-Tech.	Chair	Completed

3.3 HSSC10 Report

The Chair reported that the 11th HSSC meeting that took place in Cape Town, South Africa (6 - 9 May 2019).

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 HSSC).

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 Chair (TM) reported that the next ENCWG meeting is scheduled to take place in Wellington, New Zealand from 7 to 9 June 2020. This will be followed by a meeting of the S-101 PT Meeting from 10 – 12 June 2020. He reported that updated S-64 screen dumps showing HD bathy ENCs had been produced and some minor S-63 issues had also been resolved.

The meeting noted the report.

3.6 NCWG Report

The Chair of the NCWG (MH) reported that the 5th NCWG meeting was held in Stockholm, Sweden, from 5-8 November 2019 where the main topic of discussion was the future of the paper chart. This meeting also included a workshop for Regions charting coordinators. The next meeting will take place November 2020.

The meeting noted the report.

3.7 NIPWG Activities

No report submitted. The NIPWG had held its 6th meeting in Tallinn, Estonia from 25 - 29 November 2019. The next NIPWG meeting will take place in Brest, France from 21 to 25 September 2020.

3.8 DQWG Report (Docs 3.8A and 3.8B)

The DQWG Chair reported that one of the principal goals of the DQWG is to develop and maintain a data quality checklist for product specification developers. The last DQWG meeting took place at the IHO Secretariat from 4 – 7 February 2020.

3.9 Report from WNWWS-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. He noted that the WNWWS11 recommended to change the correspondence group into a project team to speed up the development. The CG is working on portrayal items that include reduction of clutter using various clutter including clustering. The goal is to have an operational version 2.0.0 at tend of 2024.

The Chair noted that the request to become a PT will have to be sent to the IRCC. The meeting noted the S-124 report.

4. S-100 Proposals for Consideration

4.1 Draft Guideline Web Services based S-100 Data Exchange [IALA] (2 papers A and B)

Julias Moeller reported that the draft IALA Guideline (document 4.1B) provides guidance on the application of reliable and efficient web service based communication for the exchange of S-100 data. The document is intended for service providers and system developers, who will implement S-100 based technical services in the context of e-Navigation.

HP proposed that the digital signature may sometime be bigger than the actual payload and this needs to be taken into consideration. Chair reported that IIC (JP) will provide a presentation on real tile scheming. IIC proposed to delay the discussion to agenda item 4.17.

The meeting noted the draft IALA Guideline and invited members to provide feedback to IALA ENAV Committee (before 15 March 2020) and to forward the revised document to the S-124 CG for consideration.

IALA invited the meeting to integrate the feature 'Streamable_Exchangeset' into the S-100 standard in order to support secure data exchange for online services.

(See action).

4.2 Allocation of S-100 Product Specification Number [SCUFN]

The reported the GEBCO sub-committee on undersea feature names (SCUFN) had been tasked to Product Specification for Undersea Feature Names and to register relevant terms in the IHO GI Registry.

The Chair noted that the S-100WG could only support the development of this product specification, if it has been approved by HSSC and the allocation of an S-1XX number could only be authorised by the HSSC. Secretariat proposed that the paper should be submitted to the next HSSC for consideration.

(See action).

4.3 Uncertainty Zones [Sintef Ocean]

Chair reported that Marianne Hagaseth was not able to attend the meeting, the paper was presented for information only.

SS reported on behalf of the Sintef on the hull to hull project which that is used for calculating uncertainty zones around a vessel. Vessels will communicate their uncertainty zones which will help avert possible collisions. This project also beaming used for inland navigation. If member have any question on the paper, they should send them to Marianne Hagaseth at Sintef.

(See action).

4.4 Machine Readability of Display Plane Ordering

MS noted that the Proposal to change S-100 Part 9 section 13.3.18. (Add +order: integer to DisplayPlane in figure 9-20)

MS reported that the change supports full machine readability for display planes as defined within a portrayal catalogue, and aligns with the portrayal register.

Decision: The proposal (S-100WG5-4.4) to add an order attribute to part 9 – 13.3.18, (that corresponds to 2b-4.2.22) was accepted.

(See action).

Clarification needed on 9.13.4.4

JP proposed that this should be considered in the context of IMO certification – to discuss later.

4.5 Alerts and Indications (See S-100WG5-6.3)

MS reported that, this had been presented to the TSM7 meeting and proposed extensions to S-1-00 parts 9 and 9a. A new redline version of these parts is available as document 4.5B.

Decision: The meeting noted that paper (4.5 Alerts and Indicators), and approved the redline version of the Part 9 and 9a for inclusion in S-100 Edition 5 -

(See action).

4.6 Proposed Change to S-100 FC Model

YB reported that there is currently no reference between feature catalogue and registry content. He therefore proposed adding an (optional) attribute versionDate to the classes S100_FC_Item and S100_FC_ListedValue so that the version of an item in a FC can be back-linked to a specific time stamped item in the Registry. HB proposed that this was already possible with the current model and this change would open the door to a second way of doing the same thing.

(See action)

4.7 Inclusion of Cancellation Guidance

SS reported that this item had been presented at the TSM7 meeting, and this resulted in an action to develop general guidance on managing dataset cancellation and dataset withdrawal – for inclusion in S-100. He noted that there are there are different approaches for implementing cancellation mechanisms in several product specifications and proposed that this work should be included proposed exchange set gap correspondence group activities.

DQWG noted that there is also relevant for data quality.

*** 4.7 Decision: The meeting agree the concept of the proposals and the development of guidance on management of dataset cancellation and dataset withdrawal. This should be part of the work to be done by the exchange set gap correspondence group.*

(See action)

4.8 S-100 and Product Specifications Versions Availability

SS proposed that a mechanism is needed to link a produced dataset with the version of a product specification, and to provide a link to the version of the standard on which the product specification is based. He propped that there should be tracking notes for version PSs indicating what the changes between successive editions are.

SS noted that the need was to be able to find the past Prod Spec docs product Specs and schemas. This will require additional metadata. TM proposed that this should include release noted that captures the changes from one edition to another.

It was agreed that each product specification edition should have release noted that identify the differences between successive editions.

(See action).

4.9 S-100 Part 4 Metadata Review

Doc 4.9A - S-100 Part 4 Metadata Appendix 4a-D review

SS proposed that a full review of Appendix 4a is required, noting that the metadata section was drafted a long time ago and has been subject to numerous changes. He reminded the meeting of the TSM7 action item to create a correspondence group to carry out gap analysis of the S-100 Exchange set model, could also be tasked to carry out a review of S-100 Appendix 4a-D.

Review of proposals

1-1 Scope Remove Annex 1 – agreed

Appendix 2a-A-update complex attributes example – to update the example was not accepted. HB - this is just an example to help the reader understand the concept – it should not be linked to any prod spec. It was decided to remove the reference to S-101.

Appendix 4a-D add example of multiple product exchange set structure – renaming to CATALOG.XML and the new structure was not accepted.

HB – does not agree with mixing S-57 and S-101 data in the same exchange set – they should be kept separate.
TM – do not want to make it possible to have overlays available for S-57 products.

Breakout group) and report back.

- Change exchange set root directory name from EXCH_ROOT to S100_ROOT – agreed.
- Change S100_CatalogueIdentifier attribute date to dateTime – accepted.
- Appendix 4a-D - change Exchange Catalogue filename to CATALOG.XML – accepted
- Appendix 4a-D change S100_ExchangeCatalogue productSpecification multiplicity – accepted.
- Appendix 4a-D filename and filename inconsistency – accepted
- filePath_fileLocation Inconsistency - Decide whether to use filePath or fileLocation (filePath Name and Remarks) – accepted.

Appendix 4a-D producingAgency - Remove the attribute metadataPointOfContact or make multiplicity optional – not accepted – does not conform to 19115. Decided to move this under the metadata review for Edition 5.

(See action)

(Doc 4.9B zip file containing proposals 1 to 13) Metadata proposal forms)

(See action)

4.10 S-100 Proposals from TSM7 for WG approval [NIWC] (zip file containing proposals)

MS reported that these proposals had been discussed at TSM7 (Agenda 5.3)

- Schema file: S100PortrayalCatalog.xsd, line 246 - accepted – NIWC to update the .xsd
- 5.3b Add the following to the Part 9 description of the endColor attribute of CoverageColor: - agreed
- Miscellaneous Part 9a Corrections – accepted
- Part 9 Lua document – redline.
- Miscellaneous Part 13 corrections – accepted
- Scripting redline

- Remove Redundant Portrayal Schema and Samples – accepted
- Update 9-7.2 InterpolationType – accepted
- Update 9-12.6.3.5 TextPoint – accepted

(See action)

4.11 S-100 Portrayal Capability Gaps Proposal

MS introduced the proposed extension to S-100 Part 9 and Part 9a that was intended to address gaps in portrayal. These had been presented to TSM7 meeting by the WG. HB – reported that these are in the MML model – and this may open the door to consistency. Agreed to rather use a constraint.

Doc 4.11B. Reline document that include marked up changes for Part 9 and Part 9 was accepted.

4.12 S-100 Proposal changes to Input Schema [NIWC]

MS reported on proposed modifications to the Part 9-7 Data Input Schema. Modify the XSLT data input schema objects to align with the GFM and allow for spatial quality. Change the spatial objects from abstract to concrete. Update affected text. HB noted some inconsistencies in the redline document. After a breakout group discussion it was agree and the proposal was accepted.

The proposals and the associated redline document were accepted by the meeting.

(See action).

4.13 S-100 Proposed Miscellaneous Revisions

MS reported presented the following proposals which were;

- Proposal 1 1 Table 1-2- accepted
- Proposal 2 1 4.5.3.4 - accepted
- Proposal 3 2a 2 - accepted
- Proposal 4 2a 4.2.11 - accepted
- Proposal 5 3 6.5.3 - accepted
- Proposal 6 4 "4a Table S100_CatalogueMetadata" - accepted
- Proposal 7 5 Table 5-A-13 - accepted
- Proposal 8 9 9-7.5 2 - accepted
- Proposal 9 9 12.6.3 Fig. 9-18 - accepted
- Proposal 10 9 "Fig. 9-20 13.3.24" - accepted
- Proposal 11 GitHub S100SymbolDefinition.xsd accepted (Jeff to make the change in the document - MS to change the schema.

(See actions)

4.14 S-100 Proposed Change to Part 10c CRS

HB proposed extension to Part 10c to replace metadata a

Decisions:

- *Proposal 1 (Replace metadata attributes 4 & 5) – agreed.*
- *Proposal 2 - Replace metadata attribute 10 in Table 10c-6 (verticalDatumReference) with the attributes in Table 3 – agreed.*
- *Proposal 3 Add a clarification to the remarks column in Table 10c-6 for attributes 7a-7d – agreed.*

(See actions)

4.15 Validation checks for HDF5 and GML Data Products (Docs A – Paper, B-Structure and C – Examples)

Chair reported that the validation checks have been developed for S-111 HDF5 datasets, can be generalized into a set of core checks for all S-100 HDF5 products. She invited members to consider whether the validation checks should be included as an annex to S-100 part 10 or a separate part?

Decision: the meeting agreed that an abstract validation specification that covers all current S-100 data encodings (8211, GML, and HDF5) should be developed. This should be followed by the development of product specific validation tests.

(See action)

4.16 Proposal - add S-100 Compliancy Categories (Papers A+B)

EM reported that at S-100WG4 meeting, it was agreed that a method for expressing how items (such as Prod Specs) comply with the S-100 standard. – (This resulted in action 16 from the WG meeting). He proposed that adding compliancy levels will assist developers of product specifications understand how likely their specification will function in a systems. Change proposal request that there are 4 categories with cumulative compliance – which will be recorded in the exchange catalogue metadata (as per paper B).

Decision: The proposed extension text (S-100WG5-1.16B) was agreed for inclusion in S-100 Ed 5

(See action)

4.17 Real-time Data in S-100 (see also IALA presentation)

JP reported that although S-100 includes section 14, which serves as a conceptual model for streaming S-100 datasets, it currently does not support the delivery of real time information from different broadcast points to an end system. He noted that aspects are broadly described in the existing section 14. The intention is to build on existing baseline but also add new functionality. Data access for real-time data is likely to be predominantly API driven.

HP – need a time frame for implementing this, citing that data streaming has already been implemented by companies such as OMC International.

Decision Recommended (Agreed) that more work was required. This is to be considered for enhancing part 14 in S-100 edition 6. It was agreed that, when ready – the concepts in this paper and the IALA paper should be submitted using a change proposals form. The proposal is to be expanded to include API support, and to extend part 15 to include mechanisms for providing dynamic and feature level data protection and authenticity mechanisms for data streaming.

(See action)

4.18 Proposal - Part 10c - new data Coding Format [4.18A – Extension, B – Clarification C- Redline]

Chair noted that the existing format for fixed station time series data does not support two use cases for fixed station time series data. They are proposing a new data Coding Format (8) for [fixed station (station wise) time series data. EM – questioned whether there will be an impact for othe product specifications. Chair proposed that the TWCWG will have to develop test to ensure compliance.

Decision: The proposed extension and clarification to Part 10c was accepted. The redline text document was accepted for inclusion in S-100 Ed 5.

(See actions).

4.19 Clarification to Part 15

RS proposed that the clarification is for S-101 – should be considered by the S-101PT. He noted that the proposed Clarification was required in order to provide additional information on how digital signatures and encryption will be used for S-101 datasets.

Action Present the proposal to the S-101 project team for consideration.

TM – proposed that a small group should be formed to look into data service delivery and associated security/authentication - taking into consideration the dual-fuel implications.

(See action)

4.21 Gridded data and HDF5 Format - data offset

Chair note that the reason for this is to include attributes standardise the way that offset information is recorded in HDF5. HB proposed that the names used for the attributes should be improved to be more reflective of what they are. Proposals accepted but dataOffset code name needs to be improved.

(See action)

4.22 S-100 Proposal Part 15 - Clarification

It was decided to continue the work on this item via correspondence.

5. S-98 Interoperability Specification

5.1 S-98 Interoperability Specification for S-100

Docs: [5.1A - 5.1B](#) (zip) and [5.1C](#)

The Chair reported on the proposed changes to S-98 to simplify the interoperability mechanisms (as discussions at TSM7). She proposed that a staggered implementation of interoperability will probably require software updates in user systems already at sea and that would be disruptive. The TSM7 recommendation was to change all references to FoB and BoB to “planning” and “monitoring”.

Decision: - Go with option 1. Move the abstract parts of S-98 into S-100 (part 16) and realign S-98 content so as to provide an interoperability implementation. The new part 16 in S-100 Ed5 will include the UML models and descriptive text on how to create an interoperability catalogue. The Restructure S-98 document should describe how the abstract functionalities described in S-100 Part 16 are encoded and implemented.

(See action)

6. S-100 General Topics

6.1 Progress Report on S-100 Infra-System Development [YB]

Online presentation. Vice-Chair (YB) reported that KHOA has contributed towards the S-100 ecosystem by developing and maintaining S-100 infra-system. He invited members to review and provide feedback on the S-100 infrastructure. Chair commended the work on the new SVG editor.

6.2 S-100 Test Bed Platform

Online presentation provided by YB.

(See action)

6.3 S-100 Portrayal Catalogue User Stories

MS reported that the proposal to provide some user stories on the harmonization of portrayal catalogue and alerts and indications for ECDIS. The paper identified the main components of an alert catalogue and is intended as an indicator for KHOA's implementation of the PCB. HP supported the proposal.

(See action)

6.4 S-97 Edits for improved readability

The Chair reported that S-97 had already been endorsed at HSSC11 however had not been finalized. The proposed changes were accepted for publication as 1.1.0.

(See action)

6.5 Unique Identifiers for Maritime Resources [

DL reported that unique identifiers are necessary development of e-Navigation and MRNs can be applied in numerous areas within the maritime domain.

6.6 The Status of S-100 Part 8 (Imagery and Gridded Data)

Chair reported that while developing sample data for coverage information, some gaps and deficiencies in S-100 Part 8 had been identified.

Decision: The meeting decided that Part 8 will require a review something in the future.

6.7 Gap analysis for S-100 Exchange set model

Online presentation. YB reported that, following a review of metadata in S-100 product specification, it has become evident that there are significant differences in how metadata has been implemented. Some PS's have not implemented exchange set metadata, and there are inconsistencies between those that have implemented it. He noted that although S-100 Edition 4.0.0 exchange set model permits multiple types of exchanges and there are some possible gaps that require further consideration.

Noted that these issues were reported to the TSM7 meeting and it was agreed that exchange and discovery metadata will be moved to a separate part in S-100.

Decision: The meeting agreed that a correspondence group should be formed to work on creating a new S-100 part of exchange and discovery metadata section for S-100 Edition 6.

(See action)

6.8 Waterway Harmonization as it relates to MSI and MS

DL reported that IALA will use internally defined geographical areas for indexing navigational aids in place of charted area for inland waterways. They are considering using the MRN concept, and will include a hierarchical structure. He invited the meeting to consider the concepts in the paper for IHO products and services. EM proposed that this should not be implemented too prematurely.

(See action)

6.9 S-100 Open Online Platform (S-1OOP)

Online presentation. YB presented the S-100 Open Online Platform (S-1OOP) which is intended to provide a foundation for a digital marine ecosystem for sharing data and service in an efficient and secure way. The key deliverables include the development of APIs to share data stored in the S-100 registry and to provide a suite of open source tools and applications.

He proposed that, in order to achieve this, it will be necessary to establish a group that includes a wide range of contributors that includes Member States industry experts.

(See action)

6.10 S-100 Test Data Set (ppt)

Online presentation. YB reported that TDS have been developed under the auspices of the SMART e-Navigation project. The datasets are based on the S-64 test data and references S-100 product specifications. When questions as to their availability YB noted that it may be possible to supply the data sets, however this will need to be discussed between the IHO and KHOA.

6.11 Validation schema Review S-122, S-123 and S-127

RB reported on the DQWG study to compare the S-122, S-123 and S-127 feature catalogues against their validation schema's – using an application developed by the Netherland Hydrographic Office. The application will be made available on both Windows and Apple systems. He noted that the prod specs are in GML – noted that S-101 is in 8211 so will be different.

6.12 Comments on DQWG Review of S-122, S-123, and S-127

EM reported that the S-122 and S-123 feature catalogue and XML data formats used to conduct the tests in paper 6.11 were based on S-100 3.0.0; only S-127 was based on Edition 4. Paper 6.11 raises some questions about visions of the standard and associated product specifications. He noted that, having reviewed that list of errors in paper 6.11, he was of the opinion that the majority of them were not actually discrepancies. He commended the DQWG for initiative for developing this validator, and proposed that tool should be further developed to be “schema-aware” and to allow for various considerations such as inline definitions, spatial types etc ...

He invited the meeting to discuss the appropriateness of the current S-100 versioning regime and the necessity or otherwise for a “best practice” or guidance document. HB questioned why not to use the FCB to build the GML schema, and use this process to ensure that Feature Catalogues are harmonised. Perhaps this could be included in S-98. The meeting agreed that this was a good approach.

(See action)

7. S-100 Project Team Reports and Proposals

7.1 S-100 Implementation Strategy

AK reported that Assembly proposal 2.1 (from the last Council meeting), invites MS to approve the “S-100 roadmap for the “S-100 Implementation Decade” and to task the Council to maintain the S-100 roadmap and resulting activities. Looking to implement S-101 for acceptance by IMO compliance by 2024. This will be discussed further under the dual fuel paper.

JP noted that the dual fuel discussion will highlight what efforts are needed by IHO, IEC and IHO in order to move this proposal forward.

HP (IEC) proposed that time schedule is very short, and it will discredit the reputation if the schedule is extended. If the IHO want achieve its goal – it should stop adding new items to the S-100 and S-101 for a period in order to ensure stability. This should be part of the implementation strategy.

HB stated that we should be focusing on what needs to be fixed for type approved systems and should not be talking about freezing standards – this will have a negative impact.

Chair noted that it might be necessary to limit the scope of new proposals for a period.

Decision: The meeting agreed that there should be a prioritizing of the work within in S-100 and S-101 in order to get S-100 ECDIS as a reality. The aim should be to amend the ECDIS Performance Standards for S-100 ECDIS and S-101 ENC's, and then identify what products are needed to support the other maritime services.

7.2 Risk Assessment of Dual Fuel Mode

The Chair on paper on behalf of the Chinese delegation who were not able to attend the meeting. This is also an Assembly proposal on the dual fuel mode for S-100 ECDIS systems to use both S-101 and S-57 data. It highlighted the additional work load that this will cause, and possible differences portrayal and other possible incompatibilities. The dual fuel approach may also have a big impact on ECDIS type approval requirement.

The proposal requests a detailed risk assessment on the "dual fuel" approach in order to provide more specific guidance for all affected parties.

(See action)

7.3 S-100 Gap Analysis for Type Approval

JP reported that IMO concept of a dual fuel ECDIS will remain unchanged. The navigational core system will use the IHO S-101 data. Additional S-100 based product data, will form the interface with the end use. He proposed that the dual-fuel concept, elements of S-64 relating to S-57 should be preserved and placed alongside a new sections dealing with S-100 testing.

The meeting noted the gaps in the current IHO standards and the need to further define the Dual-Fuel ECDIS in current IHO proposals to the IMO community.

Do we want to include a test for a random product specifications and associated that can be used for testing. It was agreed that this should be possible.

HB – we need to be careful to not compromise security by allowing ECDIS to openly ingest catalogues. This should only be used for testing.

Decision: the meeting agreed that work should commence on the development of a new edition of S-64 that makes provision for a dual-fuel concept and deals with testing S-100 based products.

HP- proposed to use another number other than S-64.

(See action)

7.4 S-100 ECDIS' Performance Standard, Type Approval and Operational Expectations

Chair proposed that this is as an information paper, and recommended that it should be discussed by the S-101 working group at its June meeting. She highlighted the decision tree that shows the temporal variation. The DQWG Chair noted that temporal variation had been discussed and it had been removed from the model.

HP proposed that; if the IHO wants to implement the proposals, the IMO list of alerts and indicators will have to be revised.

The meeting noted the report.

(See action)

7.5 S-57 / S-100 Dual-Fuel ECDIS [IIC – Pritchard]

JP reported that this study was needed for the development of the test datasets necessary for the development of ECDIS. The intention is to assess the implications of OEMs data producers and end users. He questioned whether S-mode for S-57 and S-101 ENC will be identical. HP stated that most of the S-mode is high level. In that area S-101 and S-57 should be the same.

HB – there are many use cases, proposed that for the transition period – if there is a re scheme – the user should receive both the ENCs. JP - OEMs should be able to assume that coverage rules will be applied consistently.

JW – noted that the cell data sizes between S-57 (5 Meg) and S-100 (10 Meg) must be considered when considering complementary data coverage.

TM - there should be no problem to have multiple portrayal catalogue to ensure compatibility between the two modes. HB – questioned why to change the portrayal for the two modes – especially during the transition period.

It was noted that the data conversion option in the presentation was not favoured by the OEMs.

(See actions)

7.6 Conversion of M_QUAL/CATZOC to S-101

The DQWG (RB) provided a presentation on the data quality outcomes from the work of the DQWG, and particular the outcomes from their last meeting that took place in Monaco during February. He proposed that the existing CATZOC values can be converted into an S-101 ENC. It will also be possible for an S-101 Database” to provide CATZOC value for S-57 ENCs.

He also highlighted the current method of symbolising CATZOC information and proposed the new method for symbolizing uncertainty data in ECDIS that had been developed by the DQWG.

TM noted that the portrayal of CATZOC should not add to the clutter / confusion for the mariner while he is underway, and should be used during planning mode.

HB – commended the efforts to improve information for the mariner, but this should not lead to inconsistencies or onerous requirements for ECDIS system resources. He reported that SevenC’s ECDIS already use a method that does not require many resources and that generates a corridor that takes uncertainty information into account

Chair proposed that in order to generate the portrayal, it will require a complicated algorithm. Se noted that this was a good starting point but will probably need refinement.

Canada noted that they will include quality information on data which is in line with the proposal.

8. S-100 Test Bed Reports

8.1 S-102 Report

DB introduced the draft template for documenting reports of S-100 based product specifications. He noted that it needed further work and invited WG members to contribute to the document, especially those who have carried out test bed projects. Noted that they are starting to look into variable resolution grids, but have decided to not spend time on this for shallow water. Canada have a project to set up an online distribution system – working with Primar to provide live updates – getting feedback from clients and

vendors. Requirement for a colour palette for day and night. Also looking at contour generation – including safety contour generation.

Holger – the metadata for coverage products and HDF5 encoding is missing from the S-100 standard and needs to be developed. Proposed that there should be more examples in S-100. He stated that SevenCs systems will not use a generated safety contour for safety reasons.

DB informed the meeting that he will no longer be able continue as Chair of the S-102 PT, and invited the meeting Chair to call for nominations for the position of S-102PT Chair and Vice-Chair.

(See action)

8.2 S-121 Report

No update report submitted. However, the Government of the Republic of Korea wished to make the following comments for the record:

First, my Government feels that the disclaimer added in S-121 1.0.0 should not only be included in S-121 itself but also be displayed on S-121-based products, such as electronic nautical charts, in order to enable end users to easily see the details of the disclaimer.

Second, there appears to be a need for an in-depth discussion on how to integrate and display conflicting information on a single electronic nautical chart or GIS, due to inconsistencies and/or discrepancies in the information provided by different States. If the conflicting information is integrated and displayed on a single electronic nautical chart or GIS as it is, this might lead to disputes among such States.

In particular, given that the activities of the IHO “do not include matters involving questions of international politics”, as stipulated in Article 1 of the IHO General Regulations, a more careful examination of this second issue is required from the development stage.

Third, given the implications of S-121 for the international community as a whole, it is imperative to explain in advance issues related to S-121 to more of the Member States, including States with maritime delimitation disputes, and reflect the opinions, if any, of such States.

8.3 S-129 Report

No update report submitted.

8.4 S-101 Report

AA informed the meeting that since the publication of Ed 1.0.0 (December 2018), the PT has shifted focus on the development of the portrayal catalogue, validation checks, encryption, alerts and indications, and the production of test data sets. He reported that he would be stepping down as chair after the June meeting and invited nominations for the position to be sent to the S-100WG Chair and secretary.

8.5 S-124 Report

The report is covered under item 03.9 – report from WWNWS-SC/S-124PT

10. External Liaison Reports

10.1 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.

10.2 OGC

JP, reported that the OGC Marine Domain Working Group (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. The 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.

The meeting noted the report.

10.3 IEC

HP reported that the IEC S-421 Route Exchange Product specification format (IEC number 63173) was expected to be published in early 2020 – but is currently behind schedule. The current work is focused on the use cases and this is reflected in the object model.

The meeting noted the report.

10.4 IEHG

DID reported noted that the IEHG used the S-101 Feature Catalogue as a starting point for their S-401 Feature Catalogue. The IEHG also plans to use S-101 symbols where possible and register all inland specific symbols within their inland ENC portrayal domain. They intend producing a new Edition 2.5 of the current IENC PS before they implementation their S-401 Product Specification.

The meeting noted the report.

10.5 WMO/JCOM

HF provided an update on the WMO S-41X weather overlay product specifications and noted that testing of their product specifications is dependent on the IHO test bed activities. She noted that the product specifications provide an opportunity to streamline and standardize outputs of marine weather information on a global level. Planned release dates; S-412 2021 (Q3); S-413 2022(Q1); S-414 2022 (Q3).

11. Any Other Business

11.1 Malacca and Singapore Straits Presentation

MQA provided a presentation on the S-100/S-101 implementation plan for the Malacca and Singapore Straits ENCs. He noted that based on reports that S-101 ENC production and validation tools will be ready by end of 2022, Indonesia are working on an S-57 to S-101 transition plan that takes into account an ECDIS “dual-fuel” approach. He noted that at the MSS ENC sub-committee meeting that took place in Tokyo (Feb 2020),

it was decided to establish an ENC task group to formulate harmonised conversion and quality assurance procedures, and to identify suitable training programs.

Chair thanked Indonesia and commended that it was taking the lead in providing an S-101 service.

11.2 Closing Comments (Chair)

The Chair proposed that the priorities should be; the provision of test data required for S-100 implementation, the development of validation checks, the publication of S-100 Edition 5 and the publication of S-101 Edition 2 (that is aligned with S-100 Edition 5).

12. Review of Meeting Actions

The meeting reviewed the list of actions.

13. Date and Venue of Next Meeting

The Chair reported that Finland had offered to host the next S-100WG meeting in Helsinki – during the 1st week in March (t.b.c).

14. Close of Meeting

The Chair thanked the UKHO 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

Ref	Description	Who
4.1	Members invited to support the work on developing the IALA guideline document on real time data / Web Services. This work should take into account the comments on the possible size of digital signatures, and the proposals in document 4.17.	IIC, IALA
4.2	Advise the SCUFN Chair that the request for allocating product specification numbers must be submitted to the HSSC/IRCC	Chair
4.3	Report back to Sintef thanking them for their paper, and inform them that the meeting considered their paper was more appropriate for the work being undertaken by the IEC (rout exchange format).	Chair/SS
4.4	The proposal for machine readability of display plane ordering (paper 4.4) was accepted for inclusion in S-100 Edition 5. This must include an update to the UML model (to include a new role).	Chair/TSSO
4.5	Apply the proposed changes to the UML (Fig 9.10) and all other text changes to S-100 Part 9 – for Edition 5.	Chair/TSSO
4.6	Implement the revised method of creating a reference between a feature catalogue and registry content. HB to provide KHOA with their comments on how to achieve this without having to implement the proposed changes.	HB/KHOA
4.7	Amend the remarks and multiplicity (i.e. from 0:1 to 0:*) for the proposal on data replacement, and apply the other proposed editorial changes. (for inclusion in Edition 5).	PRIMAR/TS SO

4.7	Develop guidance on managing dataset cancellation including dataset and ancillary file withdrawal procedures. This task is to be included with the work that is to be done by the exchange set gap correspondence group (for inclusion in Edition 5).	PRIMAR/SEC
4.8	Develop a mechanism for documenting change control information for S-100 based product specifications. Ensure that all PS versions (including schemas and other associated resources) are available from the Registry - Prod Spec registers. (This needs to take account of paper 6.12.)	KHO/TSSO
4.9	Apply the proposal at Appendix 4a-D for attribute producing Agency. It was decided that this is to be dealt with by the metadata review group – (for Edition 5) Secretariat to send redline version of the original document to SS.	SS/TSSO
4.9	Include the revised proposal for S -100 Part 4 metadata, that was agreed by the meeting review group, (for Edition 5). (The redline document that includes the revised text, is to be sent to Secretariat).	SS/TSSO
4.10.	Apply all NIWC proposals in paper 4.10. (Note: these were also agreed at TSM7) (for Edition 5).	NIWC/TSSO
4.12	Apply all NIWC updates to Part 9-7 "Data Input Schema" (for Edition 5).	TSSO
4.13	Apply all proposed "Miscellaneous Revisions" updates in spreadsheet (for Edition 5)	TSSO
4.14	Apply the proposed changes for Part 10c (for the Edition 5)	TSSO/RM/HB
4.15	Establish a validation sub group to develop validation checks that span across the entire S-100 framework. Target 2022 [t.b.d]	IC-ENC lead/IIC/Primary/HB/Chair
4.16	Add the compliance metadata extension proposed in paper 4.16 to Edition 5. Redline text to be finalised and submitted to TSSO for inclusion in Edition 5.	EM/TSSO
4.17	S-100 WG members invited to work with IALA to continue the development of generic S-100 data streaming specification – in conjunction with the OGC work. Report on the progress to be provided to TSM8	IIC - lead
4.18	Include the redline text for the new data Coding Format (proposed in paper 4.18), for S-100 Edition 5.	TSSO
4.20	Proposal 4.20 on the HDF file families - to be take as correspondence for further discussion	Chair/Stacy
4.21	The clarification relating to data offset code was approved - for Edition 5. Note; the name of the attribute name needs to be improved.	RM/TSSO
5.1	Prepare a new redline version of S-98, that moves the abstract parts of S-98 into S-100 (part 16) and realign S-98 content so as to provide an interoperability implementation. The new part 16 will include the UML models and descriptive text on how to create an interoperability catalogue. Get approval from HSSC13. Provide the redline text to secretariat for inclusion in Edition 5.	Chair
6.2	Invite MS and stakeholders to use the S-100 test bed platform for testing and verifying their test data.	Chair

6.2	NIWC to forward the “user stories” study to KHOA and work with them to implement alerts and indicators into the Portrayal Catalogue Builder.	NIWC/KHO A
6.4	Post S-97 on the IHO website as Edition 1.1.0	TSSO
6.7	Metadata correspondence group to draft a new S-100 part for exchange and discovery metadata – for inclusion in S-100 Edition 5.	NOAA- lead/IIC/Pri mar/ICENC/ Tel-CARIS
6.8	Provide recommendation on the implementation of MRNs to the S-100 WG. Also include recommendation on what needs to be added in the Registry in order to make it usable at the database and product levels.	DL
6.9	Provide a presentation/paper on the S-100 Open Online Platform to HSSC and recommend that HSSC invite MS, Industry and other experts to participate in the Open Online Platform project.	Chair/KHOA
6.12	Invite DQWG to liaise with all other WG and PT’s that are developing product specifications (including from other organisations) in order to get feedback on what is required for testing environments, and what test assumptions should be included.	Chair
6.12	Develop a “best practice” guidance document providing information on versioning and release management protocols for S-100. Investigate the possible development of and xslt tool to facilitate this.	HB/NIWC
6.12	Noting the issues highlighted in paper 6.12 concerning Prod Spec feature catalogue inconsistencies, invite Netherlands to continue the development of the validation tool with a view to including it into the S-100 infrastructure tools. [NL, DQWG]	RB/DQWG
6.12	Draft a straw man document on the technical and strategic process to be followed to ensure that product specification dependencies on S-100 Editions, are harmonised - for HSSC12.	Chair
7.2	Inform the Assembly on the “dual-fuel” discussion/decisions and implications for the S-100WG.	Sec
7.3	Submit a proposal to HSSC12 requesting that a new edition of S-64 (or other number), which includes a test regime and test datasets, be developed for S-100 ECDIS.	Chair
7.4	Provide feedback to Australia on the discussion on temporal variation, and request that they submitted a revised version to the S-101PT and DQWG for consideration.	Chair/Aus
7.5	Prepare a high level information paper that covers the principles of operation for the dual fuel concept.	IIC(lead)/No rway/ESRI/7 Cs/NIWC/Fr ance/Finlan d/Canada/U K/Denmark/ Sweden/Nav tor/Primar/ Italy/Netherla nds/USA- NGA/NOAA/ Furuno

8.1	Work on the validation rules for S-102 data, that includes HDF 5 encoding. Start with checking the validation rules against the S-102 product specification. Prepare the next edition (of S-102) to meet readiness level 4. (for S-102 Edition 3 – 2023).	S-102 CG
8.1	Request nomination for Chair / Vice chair of the S-102 PT. Nominations to be submitted to the S-100WG Chair.	Chair/Sec
8.1	Submit propose to the next HSSC, informing that the publication Edition 5 of S-100, is requested be postponed untill early 2022.	Chair

Agenda

Document Number Prefix	Agenda Item	Agenda Item / Document Title
1. Opening and Administrative Arrangements		[Powell]
S100WG5	1.1	List of Documents
S100WG5	1.2	List of Members and List of Participants
S100WG5	1.3	S-100WG ToRs
2. Approval of Agenda		[Powell]
S100WG5	2.1	Draft Agenda
3. Matters Arising and HSSC Working Group Reports		[Powell]
S100WG5	3.1	Approval of S-100WG4 Minutes [Powell]
S100WG5	3.2	Review of S-100WG4 Actions [Powell]
S100WG5	3.3	HSSC11 Report [Powell]
S100WG5	3.4	HSSC Actions [Powell]
S100WG5	3.5	ENCWG Report []
S100WG5	3.6	NCWG Report []
S100WG5	3.7	NIPWG Activities []
S100WG5	3.8	DQWG Report (also QoBD – ECDIS Performance) [Broekman]
S100WG5	3.9	Report from WWNWS-SC/S-124PT (includes 8.5) [Mong]
4. S-100 Proposals		
S100WG5	4.1	Draft Guideline Web Services based S-100 data exchange [IALA]
S100WG5	4.2	Allocation of S-100 Product Specification Number [SCUFN]
S100WG5	4.3	Uncertainty Zones [Sintef Ocean]
S100WG5	4.4	Machine Readability of Display Plane Ordering [Stamenkovich]
S100WG5	4.5	Alerts and Indications (See S-100WG5-6.3) [Stamenkovich]
S100WG5	4.6	Proposed Change to S-100 FC Model (Papers A+B) [Baek]
S100WG5	4.7	Inclusion of Cancellation Guidance [Skjaeveland]
S100WG5	4.8	S-100 and Product Specifications Versions Availability [Skjaeveland]
S100WG5	4.9	S-100 Part 4 Metadata Review (Papers A + B) [Skjaeveland]
S100WG5	4.10	S-100 Part 13 Redline update (Ref TSM7-5.3) [Stamenkovich]
S100WG5	4.11	S-100 Portrayal Capability Gaps Proposal [Stamenkovich]
S100WG5	4.12	S-100 Proposal changes to Input Schema [Stamenkovich]
S100WG5	4.13	S-100 Proposed Miscellaneous Revisions [Stamenkovich]
S100WG5	4.14	S-100 Proposed Change to Part 10c CRS [Malyankar]
S100WG5	4.15	Validation checks for HDF5 and GML Data Products [Malyankar]
S100WG5	4.16	Proposal - add S-100 Compliancy Categories (Papers A+B) [Mong]
S100WG5	4.17	Real-time Data in S-100 [Pritchard]

S100WG5	4.18	S-100 Proposal Part 10c - new data Coding Format	[Seroka]
S100WG5	4.19	S-100 Proposal Part 15 - Clarification	[Sandvic]
S100WG5	4.20	HDF5 File families	[Malyankar]
S100WG5	4.21	Gridded data and HDF5 Format - data offset	[Malyankar]
S100WG5	4.22	S-100 Proposal Part 15 - Clarification	[Malyankar]
5. S-98 Interoperability Specification			
S100WG5	5.1	S-98 Interoperability Specification for S-100	[Powell]
6. S-100 General Topics			
S100WG5	6.1	Progress Report on S-100 Infra-System Development	[Baek]
S100WG5	6.2	S-100 Test Bed Platform	[Baek]
S100WG5	6.3	S-100 Portrayal Catalogue User Stories (Act TSM7-5.3)	[Stamenkovich]
S100WG5	6.4	S-97 Edits for improved readability	[Powell]
S100WG5	6.5	Unique Identifiers for Maritime Resources	[]
S100WG5	6.6	The Status of S-100 Part 8 (Imagery and Gridded Data)	[]
S100WG5	6.7	Gap analysis for S-100 Exchange set model	[Baek]
S100WG5	6.8	Waterway Harmonization as it relates to MSI and MS	[Lewald]
S100WG5	6.9	S-100 Open Online Platform (S-1OOP)	[Baek]
S100WG5	6.10	S-100 Test Data Set	[Baek]
S100WG5	6.11	Validation schema Review S-122, S-123 and S-127	[Broekman]
S100WG5	6.12	Comments on DQWG Review of S-122, S-123, and S-127 (Rev 1)	
7. S-101 Strategic Topics			
S100WG5	7.1	S-100 Implementation Strategy	[Kampfer]
S100WG5	7.2	Risk Assessment of Dual Fuel Mode	[TBD]
S100WG5	7.3	S-100 Gap Analysis for Type Approval	[Pritchard]
S100WG5	7.4	S100 ECDIS' Performance Standard, Type Approval and Operational Expectations	[Sanchez]
S100WG5	7.5	S-57 / S-100 Dual-Fuel ECDIS	[Pritchard]
S100WG5	7.6	Conversion of M_QUAL/CATZOC to S-101	[Broekman]
8. S-100 Project Team Reports and Proposals			
S100WG5	8.1	S-102	[]
S100WG5	8.2	S-121	[]
S100WG5	8.3	S-129	[]
S100WG5	8.4	S-101 Report	[Armstrong]
S100WG5	8.5	S-124 (see 3.9)	[Mong]
9. S-100 Test Bed Reports			
S100WG5	9.1	S-100 NIWC Test Bed Report	[Stamenkovich]
S100WG5	9.2	KHOA Testbed Report	[Baek]
10. External Liaison Reports			
S100WG5	10.1	ISO	[]
S100WG5	10.2	OGC	[]
S100WG5	10.3	IEC	[]

S100WG5	10.4	IEHG	□
S100WG5	10.5	WMO – JCOMM	□
11. Any Other Business			
S100WG5	11.1	Malacca and Singapore Straits Presentation	□
S100WG5	11.2	Closing Comments	
12. Review of Meeting Actions			[Powell]
13. Date and Venue of Next Meeting			[Powell]
14. Close of Meeting			[Powell]

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