



**17th MEETING OF THE DATA QUALITY WORKING GROUP
8- 9 February 2022 –VTC**

FINAL MINUTES

1. OPENING AND ADMINISTRATIVE ARRANGEMENTS

The meeting was chaired by Mr. Edward Hands (Norway). Thirty-eight delegates representing 17 Member States (Brazil, Canada, China, Denmark, Finland, France, Germany, India, Indonesia, Italy, Netherlands, Norway, Portugal, South Africa, Sweden, United Kingdom and United States), 2 representatives of the RENCs (IC-ENC¹, PRIMAR), 5 expert contributors (IEHG², Portolan Science, SevenCs, Teledyne-Caris and University of New Hampshire) attended the meeting. The IHO Secretariat was represented by Director Abri Kampfer, Technical Standards Support Officer Jeff Wootton and Assistant Directors Yong Baek and Yves Guillam.

The Chair welcomed the participants with the hope that the next meeting would be in-person. With a new Chair and Vice-Chair at the helm of the DQWG since May 2021 only, the Chair indicated that the main objectives of the meeting were to share an updated overview of all the tasks in progress and determine the best way forward.

The meeting agenda was adopted without changes.

The Chair provided a summary of the status of all current DQWG actions.

DQWG Action 15/4: Check the model components across S-1xx for time Uncertainty as introduced by TWCWG. - Issue discussed with the chair of the TWCWG issue to be included in a review of S-104 and S-111.

DQWG 15/9: Update S-100 part 4c with ISO-19157- Issue discussed with chair of S-100WG and work has begun. Too late to get revision into edition 5.0.0 of S-100 but it can be added as clarification post edition 5.0.0. Chair requested volunteers to form a drafting group to work on the revision (**Action 17/01**).

DQWG16/03: Support the CSBWG with a white paper for HO's (ref: HSSC13/15) – Intended that survey to CATZOC work will feed into this work when completed.

DQWG 16/4: subWG to review published S-1xx PS DQ recommendations. A status report was provided later in the meeting.

DQWG 16/05: Review of S-1xx Feature Catalogues against S-101 Feature Catalogue Ed1.1.0. A status report was provided later in the meeting.

DQWG 16/06: Draft a guidance document from survey to CATZOC with general recommendations and best practices – Work has begun on this and a status report will be given at HSSC 14. A further report was provided later in the meeting.

DQWG 16/07: Investigate how CATZOC is related to Usage Bands. PRIMAR provided a further report later in the meeting.

¹ Chair of the S-101 Project Team

² Inland ENC Harmonisation Group

DQWG 16/08: S-67 Translation into French, Chinese. A status report was provided later in the meeting.

DQWG 16/09: Monitor the outcome of TSM8-6.5 – The Chair reported that the issue was raised at TSM8 but it was considered that additional discussions were needed. The issues was taken to S-100WG 6 and was incorporated into a wider proposal to modify the S-100_DatasetDiscoveryMetadata catalogue. S-100WG approved the proposed New Part of S-100 for Discovery Metadata for Information Exchange Catalogues and it is subject to a final review by the middle of Feb 2022. Action Closed.

The outstanding actions were discussed and updated accordingly, see Annex A.

2. Matters arising from HSSC 13

The Chair provided an update on matters arising at the last HSSC meeting held in May 2021. The key issued highlighted were:

- Proposed amendments to the roadmap for S-100 implementation with amendments to the list of products on which to place special focus and an amendment to clarify the progress of S-101.
- The establishment of two new projects Teams: Polygonal Demarcation of Global Sea Area (S-130) PT and The Maritime Autonomous Surface Ships (MASS) PT. The Chair as a member of the MASS PT highlighted the importance of providing recommendations and support to autonomous shipping initiatives. The Chair noted his intentions to monitor outcome from the MASS PT and report back to the group on DQ related issues (Ref HSSC Action 13/49) (**Action 17/02**).
- HSSC ISO 9001 Cell has been established led by the HSSC Vice chair to experiment with the application of ISO 9001 principles on the developments the Product Specification for ENC's S-101 ed. 2.0.0.

The HSSC13 List of Decisions and Actions for the DQWG are:

- HSSC13/48 - HSSC welcomed the availability of the Spanish version of S-67 and invited Member States, to consider the possibility of translation of S-67 Ed.1.0.0.
- HSSC13/49 - HSSC encouraged member states to start populating appropriate POSACC/SOUACC values in existing S-57 ENCs for relevant spatial objects in preparation for conversion to S-101 – Permanent action.
- HSSC13/50 – DQWG to report on the progress in the development of guidelines and recommendations to HO's based in best practices to allocate CATZOC values from survey data qualifies in application of the new Ed 6.0.0 of S-44.
- HSSC 12/51 – HSSC noted and encouraged the support (in progress) following a request from the CSBWG to the DQWG – Decision
- HSSC13/52 – HSSC agreed on the proposed recommendations to apply some ISO 9001 principles in the developments of Ed 2.0.0 of S-101 PS.

The Chair provided a brief summary of the progress of the HSSC ISO 9001 cell. The group is composed of the HSSC vice chair, The S-101PT Chair and Vice Chair, S-100 WG Chair and DQWG chair. It was also intended to have 1 or 2 ISO experts in the group but these are not currently present. A Gantt chart and critical path approach is being used to manage the major components and dependencies but this is currently light on 'real' solid dates. Work is ongoing to assess the various risks and opportunities inherent in the work and trying to overcome or address these with concrete actions.

The key role of DQWG within this will be the review of the various components as they become available. Including Feature Catalogue and validation checks.

3. Provide Data Quality educational materials for the use of mariners

Agenda item 3.1 relating to a proposal to broaden the scope of S-67 was addressed at a later point in the meeting.

The Vice Chair reported that work on the Chinese language version of S-67 was now finished and confirmed China MSA's intention to maintain its updates in Chinese to ensure its consistency with the latest English language version. It was requested that the new version be added to the official IHO catalogue of publications. Assistant Director, *Yves Guillam* (IHO Sec.) Congratulated China MSA for the production of the document highlighting that foreign language versions of the S-67 document are always welcomed. It was agreed that the document would be published on the IHO website and that China MSA would be responsible for updating the document as required. **(Action 17/04)**.

Nicholas David (FR) confirmed that the first draft of the French translation has been completed and is currently being checked. It is hoped that this will be completed by summer 2022. France will provide an update on the progress at DQWG 18 **(Action 17/03)**.

5.1 Review of S-1xx Feature Catalogues

The Chair provided an update on the work regarding a review of the S-1xx feature catalogues. The aim of the work is to crosscheck the feature catalogs against each other to identify differences and highlight any potential interoperability issues. The original plan had been to await edition 1.1.0 of the S-101 Feature Catalogue before commencing the review work. It was noted however that at the S-101 PT8 meeting it was announced that the DCEG draft edition 1.0.2 was now ready. Furthermore that it is planned to have edition 1.0.2 of the S-101 feature catalog ready by March 2021. It is considered that this will provide a stable baseline that should be suitable for testing with limited changes envisaged before edition 1.1.0. Following discussions with the Chair of the S-101 PT it has been agreed that review work can begin as soon as edition 1.0.2 becomes available. The Chair reminded members that the decision to establish a subWG to work on this review task had been taken at DQWG16 and took the opportunity to formalize this and requested volunteers to join the subWG. **(Action 17/08)**.

Rogier Broekman (NL) enquired about the status of the tool to translate the Feature Catalogue XML to Word format to facilitate the review work. *Sean Legeer* (US-NOAA) confirmed that the conversion tool has been developed and is available for use. It was noted that this is the first version, and any feedback would be welcome. If any issues are found NOAA will be fully supporting it and will make and changes deemed necessary.

The S-101PT Chair (*Tom Richardson – IC-ENC*) enquired about the exact nature of the checks that the subWG will do on the Feature Catalogue. *Rogier Broekman* (NL) confirmed that a template for the review work has already been created and is available for use, and stated his availability to assist in the review work if required.

4. Review S-100 Based Product specifications for DQ Elements

The Vice Chair provided a report on the work of the subWG established to conduct a crosscheck review of the data quality chapters of the available S-1xx Product Specifications. The subWG comprising of the Vice Chair, NL, SE and UNH has implemented the cross check of DQ chapters of 8 published S-1xx PSs including S-101, S-102, S-111, S-121, S-122, S-123, S-127 and S-129. The recommended data quality measures of each S-1xx PS were identified and checked. A cross check matrix was prepared for the different S-1xx products in accordance with IHO publication S-97 Ed 1.1.0 - IHO Guidelines for Creating S-100 Product

Specification and a summary of the results was presented. Recommendations were made for the further work of the subWG and these were captured as actions.

SubWG to develop a template for the DQ chapter of S-1xx Product Specifications (**Action 17/05**).

SubWG to prepare a report of key finding and recommendations for the individual Product Specifications (**Action 17/06**).

SubWG to continue review of new and amended Product Specifications (**Action 17/07**).

3.1 Proposal from ENCWG

The ENCWG Chair (Tom Mellor– UKHO) presented a proposal to widen the scope of S-67 and a subsequent name change for the document.

Following the grounding of ABFC Roebuck Bay the Australian Hydrographic Services wanted to publish safety information for mariners on the compilation process of ENC's. As part of this work the ENCWG drafted an Information paper on ENC Generalization, Over-Scaling and Safety Checking Functions in ECDIS'. HSSC subsequently tasked ENCWG with defining the best way to publish and maintain the information contained in this information papers. A number of options were investigated, including the use of social media, periodicals, standalone websites but none of these were considered suitable. In order to ensure proper maintenance of documents, HSSC tasked the ENCWG to consider existing publications in force to incorporate the ENCWG mariner guidance materials.

S-65 was considered but it was noted that this is really aimed at the hydrographic offices for the production of ENC data and isn't considered to be a forward facing document intended for use of mariners. S-66 was also considered and although it was acknowledged that it contains some basic information regarding the use of ECDIS the majority of information surrounds the mandate of ECDIS and how this can be used to satisfy carriage requirements and doesn't really relates to how the data should be used in the ECDIS. The ENCWG have highlighted S-67 as the most appropriate place to incorporate all ENC and ECDIS related information directed specifically towards the mariner. The ENCWG therefore proposed to the DWQG a name change from IHO S-67 Mariners' Guide to Accuracy of Depth Information in ENC to, "IHO S-67 Mariners' Guide to use of ENC data in ECDIS". It was suggested that such a name change would allow for any future additional guidance related to ENC and ECDIS to be more easily incorporated into a single authoritative IHO source, including future cyber security information.

Director Abri Kampfer (IHO Sec) enquired if there had been any consideration given to the creation of a completely new publication where the ENCWG could assume complete ownership and maintenance responsibility. It was suggested that the existence of a shared document without ownership by a single working group could prove problematic. This issue was acknowledged but it was suggested that the benefits to the user of providing a single authoritative document would outweigh the problems caused in terms of administration and maintenance. *Assistant Director, Yves Guillam* (IHO Sec.) Suggested that S-66 might be a more suitable place to contain the new guidance information noting that section 1 of S-66 was developed specifically for the use of the mariner. An alternative solution was offered whereby the information under consideration could be included as an addendum or set of annexes to S-66 negating the

need to change S-67. *Tom Mellor* confirmed that this approach had been investigated but noted that it was considered that if this approach was taken then S-67 would no longer be needed as it could be incorporated into S-66. The key issue was underlined as being an attempt to consolidate all the information directed at the mariner into one place.

Rogier Broekman (NL) also raised questions regarding the ownership of the document. It was noted that only one working group will have ownership of the document and report to HSSC on it sharing ownership in the manner proposed would create problems. It was further noted that a great deal of effort and resistance was overcome in order to get S-67 published in the first place and it was questioned as to whether the proposal was really the best way forward. The Chair also raised concerns regarding how the existing and proposed translated versions of S-67 would be handled and maintained. Comments supporting the proposal were received from several members of the group and no objections were raised by the group. It was agreed that the Chair and ENCWG Chair would provide a joint paper for submission at HSSC 14 for member state consideration (**Action 17/10**). *Director Abri Kampfer* (IHO Sec) confirmed the possibility of taking the issue for consideration at HSSC but emphasized that a good argument would need to be presented highlighting the advantages and disadvantages of the proposal.

5.2 CATZOC and usage bands

Svein Skjæveland (ECC – PRIMAR) presented a report concerning analysis conducted the relationship between CATZOC and usage bands based on the current status of the ENCs in the PRIMAR database. The report showed the total number of instances of a CATZOC category encoded in each usage band, and the percentage according to the total of all CATZOC encodings available within each usage band. Furthermore figures were presented to demonstrate how many instances of a CATZOC category are encoded in each usage band, and the percentage within the CATZOC category. The analysis highlighted some interesting points especially the relatively high percentages of CATZOC U especially in usage band 4-6. It was suggested that this could prove beneficial input to eh survey to CATZOC guidance and attempt should be made to reduce the incidence of CATZOC U in ENC products. *Assistant Director, Yves Guillam* (IHO Sec.) thanked PRIMAR for their work and noted that the analysis would be useful for work by the IRCC to define strategic performance indicators based around the percentage of navigationally significant areas that are adequately surveyed (**Action 17/11**).

5.3 Guidance from Survey to CATZOC

The Chair reported on the progress of the CATZOC subWG established at DQWG16. There have been two meeting of the group so far and work is underway to prepare a first draft of the guidance document. The Survey to ZOC paper presented at the last meeting has provided a very useful basis for most of the work so far.

Christos Kastrisios (University of New Hampshire) provided a presentation of the work conducted in collaboration with SHOM to create matrices to automatically convert S-44 survey data into CATZOC/QoBD values. *Assistant Director, Yves Guillam* (IHO Sec.) emphasised the need to finalise the document and get the guidance publicly available for use. It was agreed that a new meeting of the subWG be arranged as soon as possible in order to achieve this. (**Action 17/12**). The meeting commended the University of New

Hampshire on their work and tests in support of this high priority item. The meeting agreed to put some resources on this task in order to accelerate the availability of these Guidelines in 2023

Scott Youngblut (CHS) endorsed the developed of the matrices presented noting that their use could help answer some difficult questions relating to the allocation of quality values. Furthermore it was suggested that creating a document to explain the matrices could be useful.

5.4 Crowd Sourced Bathymetry

The Chair reported on work done to support the CSBWG. The primary focus of efforts has been to assist with the redrafting of their B-12 document and specifically to chapter 4, which relates to Data Quality. There was a desire to consolidate the chapter and improve its readability. A key point was to emphasize the importance of data quality elements whilst emphasizing the importance of CSB and encouraging engagement. The Chair has been involved in the redrafting efforts. It is intended that the survey to CATZOC guidance document will provide valuable input to a white paper providing advice and best practice for the use of Crowdsourced bathymetry.

5.5 Swept Wrecks

The Chair reported on a paper submitted by the Nautical Cartography Working Group related to a proposed revision of S-4 for Swept wrecks to reflect changes in technology. It is intended to make the definitions system independent focusing on the uncertainty and reliability of a measurement rather than the method used to obtain it. There is a desire to avoid introducing new symbols to S-4 so propose to reuse the existing by altering the definitions. Three categories of uncertainty for wrecks and obstructions have been proposed: 1) High uncertainty – low confidence for depths that are not reliable or estimated. 2) Medium – for depths with average uncertainty and moderate confidence – investigated using reliable survey techniques. 3) Low uncertainty – Highest confidence for the most reliable depths measured using the best currently available methods. No comments or objections were raised and the decision was taken to endorse the proposed changes.

6.1 Methodology for the Display of Quality Information

Christos Kastrisios (University of New Hampshire) presented the results of an online user survey of five alternative coding schemes for the display of quality information. One finding of specific note was that all the respondents who had knowledge of the existing star symbology preferred all of the five alternative display schemes to the existing star symbology. The report was well received.

8 AOB

The chair made a fresh call for a volunteer to take the role of secretary for the working group. No volunteers came forward

9 Date and time of the next meeting

The next meeting is scheduled to be a physical meeting, 7-9 February 2023. Venue to be decided, Monaco as alternative.



Annex A – List of Decisions and Actions

Action Number	Action	Delegate	Target date/Event	Status
15/04	Check the model components across S-1xx for time Uncertainty as introduced by TWCWG.	Chair	Review S-104, S-111	Work in Progress
15/09	Update S-100 part 4c with ISO-19157.	Chair	DQWG 18	Planned
15/14	Monitor and report inconsistencies between S-67 and INT-1 section V.	Chair	None	Permanent
15/15	Timeframe between S-101PT and DQWG to be harmonized.	Chair/S101PT Chair	HSSC13	Permanent
16/03	Support the CSBWG with a white paper for HO's (ref HSSC13/15).	Chair	DQWG18	Work in Progress
16/05	Review of S-1xx Feature Catalogues against S-101 Feature Catalogue Ed.1.1.0.	Chair, Vice Chair	Awaiting S-101 Ed.1.1.0	Planned
16/06	Draft a guidance document from survey to CATZOC with general recommendations and best practices.	CATZOC Sub WG Chair, CA, DK, FR, NL,UK,US,CSMART,UNH	HSSC 14	Work in Progress

Action Number	Action	Delegate	Target date	Status
17/01	Volunteers for the S-100 part 4c drafting group to inform Chair (Ref: Action 15/09)	All	25 th Feb	Planned
17/02	Monitor outcomes from MASS PT and report back to group on DQ related issues (Ref HSSC Action 13/49)	Chair	DQWG 18	Planned
17/03	Provide update on S-67 translation into French (Supersedes action 16/08)	FR	DQWG 18	Planned



17/04	Publish Chinese language version of S-67 on IHO website	IHO Sec	none	Planned
17/05	SubWG to develop a template for the DQ chapter of S-1xx Product Specifications	Vice Chair, NL, SE, UNH	DQWG 18	Work in progress
17/06	SubWG to prepare a report of key finding and recommendations for the individual Product Specifications	Vice Chair, NL, SE, UNH	DQWG 18	Work in Progress
17/07	SubWG to continue review of new and amended Product Specifications	Vice Chair, NL, SE, UNH	none	Ongoing
17/08	Volunteers for the S-1xx FC SubWG drafting group to inform Chair	All	1 st March	Planned
17/09	SubWG to begin work on Review of S-1xx Feature Catalogues upon delivery of Ed 1.0.2 of S101 FC (Supersedes action 16/05)	Chair, Vice Chair,	DQWG 18	Planned
17/10	Prepare a joint paper on the proposed changes to S-67	Chair, ENCWG Chair	HSSC 14	Planned
17/11	IHO Sec to liaise with PRIMAR Re: SPIs for IRCC	IHO Sec	None	Planned
17/12	CATZOC SubWG to work to finalise Survey to CATZOC guidance document (Supersedes action 16/06)	CATZOC SubWG Chair, CA, DK, FR, NL, UK, US, CSMART, UNH	DQWG 18	Work in progress

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