

**15TH MEETING OF THE DATA QUALITY WORKING GROUP (DQWG)
IHO Secretariat, Monaco, 4 – 7 February**

Contribution to the IHO Work Programme 2019	
Task 2.1.2.6	Organize, prepare and report meetings of DQWG
Task 2.4.9	Maintain S-67 – Mariner’s Guide to Accuracy of Depth Information in ENCs

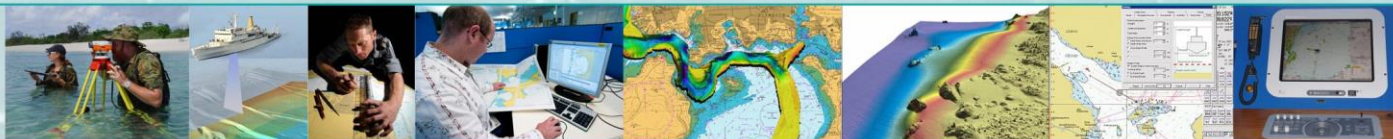
The 15th meeting of the Data Quality Working Group (DQWG) took place at the IHO Secretariat, Monaco, from 4 to 7 February.

Dr Mathias Jonas, Secretary-General of the IHO, welcomed the participants and gave a short opening address. He invited the DQWG to pursue its important cross-cutting role under HSSC in support of the development of the S-100 Implementation Roadmap, endorsed by the Council in October 2019. He also informed the meeting on the outcome of the 7th session of the NCSR¹ in January 2020 where the proposed introduction of S-101 ENCs as a transfer standard for official charts in ECDIS was acknowledged and is planned to be included in the programme of work of the IMO.

The meeting was chaired by Mr Rogier Broekman (Netherlands). Twelve delegates from 10 Member States (Brazil, Denmark, Finland, France, Italy, Netherlands, Norway, Sweden, United Kingdom and United States), 2 representatives of the RENCs (IC-ENC, PRIMAR), 4 expert contributors (Esri, SevenCs, Teledyne-Caris and University of New Hampshire²) and 2 stakeholders (CSMART³, INTERTANKO) attended the meeting. Australia could not be represented but provided important submission documents that were addressed during the meeting. The IHO Secretariat was represented by Assistant Director Yves Guillam and Technical Standards Support Officer Jeff Wootton.

The Netherlands, and the Chair of the DQWG in particular, were commended for the software developed in support of the work of the DQWG aiming to cross-check automatically the feature catalogues of different S-1xx product specifications. In addition to the procedures already in place in the IHO Geospatial Information (GI) Registry, this independent analysis tool looks very promising for data quality checks, datasets validation and product interoperability. With reference made to ISO 19157 which defines the principles for describing the quality of geospatial data, the meeting was also informed on the sequence to be implemented for the evaluation of S-1xx datasets in the future.

¹ Sub-Committee on Navigation, Communications and Search and Rescue (IMO)
² Via videoconference call.
³ Carnival’s Center for Simulator Maritime Training.



One of the top priorities of the DQWG is to provide recommendations for modelling the quality of bathymetric data in S-101 ENC. Some use cases highlighted the critical role of these components for route planning and route monitoring for mariners. Questions were raised on the applicability of data quality indicators (horizontal and vertical accuracy) not only to wrecks, soundings, underwater rocks, ... but also to depth contours in future S-101 ECDIS. Principles for using data quality indicators were tested in some scenarios and reported by Italy, Finland and Norway. These examples demonstrated the potential of data quality indicators for improving safe navigation but also highlighted the complex situations in some coastal areas. It is considered that Hydrographic Offices will have to face new challenges when encoding some data, in particular when they are provided by different sources. Thanks to the offer made by the USA (NOAA), it is intended to provide a capability to share these scenarios; other data quality information in general; and make data quality assessment software tools available to all, through a collaborative wiki access.

Noting the production concerns already raised by S-57 ENC Producers who have started to engage in the next steps of transition towards future parallel production of S-101 and S-57 ENCs in their offices, the meeting spent a significant amount of time discussing the options and possible guidance on the way to allocate as automatically as possible, meaningful quality values of bathymetric data in future S-101 ENCs from the former S-57 ENCs M_QUAL/CATZOC values. Generic recommendations were agreed on the principles and will be reported to HSSC and submitted to the S-101 Project Team for their consideration.

It makes sense that these recommendations cannot be developed without an appreciation of portrayal considerations or their applicability to autonomous shipping and/or in the management of under keel clearance procedures. These aspects were discussed intensively, thanks to the presence of CSMART and INTERTANKO to whom training aspects are very important as well.

UNCERTAINTY VISUALIZATION

Cartographic techniques:

- ❖ Visual Variable
 - color value,
 - color saturation,
 - crispness
 - resolution,
 - texture,
 - location
- ❖ Intrinsic / extrinsic

BETTER DATA → CLEAR AND CRISP

WORSE DATA → Fuzzy AND messy

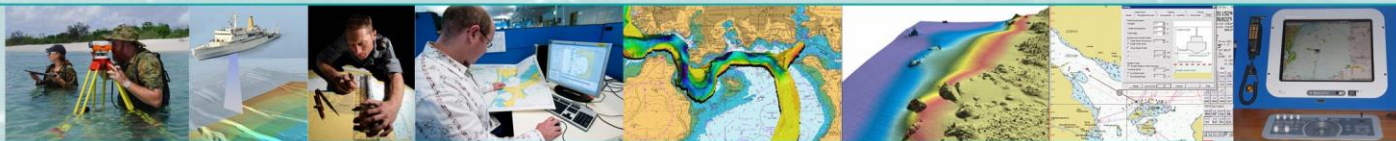
PROPOSED SOLUTION

ZOC	QoBD	Symbol	Texture
A1	1		
A2	2		
B	3		
C	4		
D	5		
U	U		
O	???		

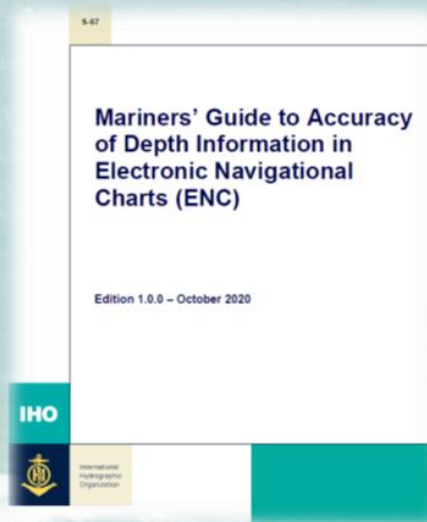
Textures of lines:

- ❖ # of Lines → Quality of Bathymetric Data (QoBD)
- ❖ Angled vs Vertical → Assessed vs Unassessed
- ❖ Single vs Double → Full vs Not Full Seafloor coverage
- ❖ Solid vs Dash → Quantified vs Not Quantified Uncertainty

Prototyping portrayal solutions for the quality of bathymetric data in S-101 ENC



Following encouraging and positive comments of the representatives of CSMART and INTERTANKO, the DQWG decided to speed up the adjudication of the comments received from the members on a draft version of the Publication S-67 - *Mariners' Guide to Accuracy of Depth Information in ENC*s. Mr Jeff Wootton led an ad hoc sub-group to address the remaining issues, with the aim that the DQWG should be able to submit the final proposed Edition 1.0.0 for the endorsement of HSSC at its next meeting in May.



The next meeting of the DQWG is planned from 9 to 12 February 2021 with the location and venue to be decided.



Participants in the DQWG-15 meeting, IHO Secretariat, Monaco