IHO File No. S3/8151/S-100

CIRCULAR LETTER 68/2026
13 November 2026

ADOPTION OF IHO PUBLICATIONS

EDITION 3.0.0 OF S-98 - DATA PRODUCT INTEROPERABILITY IN S-100 NAVIGATIONS SYSTEMS,
EDITION 2.0.0 OF S-97 – IHO GUIDELINES FOR CREATING S-100 PRODUCT SPECIFICATION,
EDITION 2.0.0 OF S-164 - IHO TEST DATA SETS IN ECDIS - INSTRUCTION MANUAL FOR THE USE OF IHO TEST DATA SETS IN ECDIS.

References:

A. IHO Resolution 2/2007 - *Procedures for making changes to IHO Technical Standards and Specifications.*
B. IHO CL 29/2026 dated 03 June 2026 – *S-100-BASED STANDARDS S-97, S-98 AND S-164 - Call for approval.*

Dear Hydrographer,

1. In accordance with reference A, the adoption of three operational Editions of S-100 Standards and Product Specifications - endorsed by HSSC at its 18th meeting- were proposed through the Circular Letters in Reference B.

2. The IHO Secretariat thanks the forty-six (46) Member States who responded to Reference B: Algeria, Argentina, Australia, Belgium, Brazil, Canada, Chile, Colombia, Cyprus, Denmark, Ecuador, Estonia, Fiji, Finland, France, Germany, Greece, India, Indonesia, Iran (Islamic Republic of), Ireland, Italy, Japan, Kiribati, Lebanon, Malaysia, Mauritius, Mexico, Netherlands, New Zealand, Nigeria, Norway, Oman, Peru, Poland, Russian Federation, Singapore, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Ukraine, United Kingdom, United States of America and Venezuela.

3. All forty-six Member States supported the adoption of all proposed Editions. Comments by Member States in addition to their vote are provided in Annex to this Circular Letter with responses from the relevant Working Group and/or Project Team, the HSSC Chair and IHO Secretariat.

4. When the Reference was issued, there were 104 Member States of the IHO with two States suspended. In accordance with the provisions of the Convention on the IHO as amended, the minimum number of affirmative votes required is thirty-five (35). As a result, the abovementioned proposed Editions have been adopted and are now available (English versions only) on the IHO GI Registry > GI Registers > Product Specification. A link to the Product Specifications has also been placed on the IHO website > Publications > Standards and Specifications.

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5. The IHO Secretariat and the HSSC Chair would like to congratulate and thank all those involved in the improvement of these core S-100 documents.

On behalf of the Secretary-General
Yours sincerely,



John NYBERG
Director

Annex: Responses to Member States' comments to IHO CL 29/2026 from the relevant Working Group and/or Project Team, the HSSC Chair and IHO Secretariat (in English only).

MEMBER STATES' RESPONSES TO IHO CL 29/2026 AND COMMENTS
FROM THE WORKING GROUP and PROJECT TEAM CHAIRS, the HSSC CHAIR and IHO SECRETARIAT

S-97, Ed. 2.0.0	PRODUCT SPECIFICATIONS

AUSTRALIA (Vote for adoption = YES)

A-5.3 (Table A-5.1)

Australia is of the opinion that 'Level 5' should not be part of the Readiness Levels affecting the completeness and maturity of product specifications (PS). Level 5 points to the availability of 'operational data' but that is not relevant in the development of a PS; is a consequence. The availability of operational data (similar to the availability of operational production, validation and navigation systems) is important when assessing the readiness of the S-100 ecosystem as a whole (refer to S-100 Compliance Categories, A-5.3) but, it is different to the assessment of a PS readiness status. Australia understands that the readiness levels outlined in A-5.2 are about tracking the completeness and maturity of all different PS components, from an idea to a point where the PS is ready to enable production and validation tools to process and deliver datasets that are ready to fulfil their intended purpose (i.e. support navigation).

A product generated from a Level 4 PS is considered 'operational' and can be used to meet chart carriage requirements as per SOLAS or other Domestic regulations. To achieve S-100 Compliance Category 4, the S-100 ecosystem must run using datasets generated from PS that achieved RL 4. RENCS and VARs must not distribute, for operational use, datasets generated from PS that are at Readiness Level lower than 4. The ISO cell should be tasked to keep track of all S-100 PS readiness levels and be the authoritative gateway to declare a PS has reached RL 4.

Comments by the S-100 Working Group Chair, the HSSC Chair and IHO Secretariat:

The HSSC Chair and IHO Secretariat thank Australia for their comments "Sweden proposes to clarify that Production Specifications for ECDIS use must provide a LUA Portrayal Catalogue, if portrayal is required. The clarification is needed as a direct consequence of making XSLT portrayal optional for ECDIS implementation in S-98 ed.3.0.0. It should be clarified that this imposes a requirement to provide a Lua portrayal catalogue for product specifications that are used in ECDIS. Additional clarification is proposed in S-97 section B-14:

S-100 defines an XSLT-based portrayal mechanism in Part 9. Edition 4.0.0 added the LUA scripting language as a second portrayal mechanism and defines a standard mechanism for including scripting support in S-100 based products. Developers/OEMs may prefer LUA due to promises of performance and similarity to common programming languages. For product specifications that require portrayal in ECDIS, a Lua portrayal catalogue needs to be supplied, as the implementation of XSLT based portrayal is optional in S-98 edition 3.0.0.

INDONESIA (Vote for adoption = YES)

Pushidrosal approves the proposed Edition 2.0.0 of S-97 and welcomes the updated guidance to support consistent implementation of S-100 Product Specifications.

Comments by the S-100 Working Group Chair, the HSSC Chair and IHO Secretariat:

The HSSC Chair and IHO Secretariat thank Indonesia for their comments.

MALAYSIA (Vote for adoption = YES)

Malaysia approves S-97 because it strengthens consistent product development, validation, interoperability and data quality, supporting our S-100 implementation roadmap objectives.

Comments by the S-100 Working Group Chair, the HSSC Chair and IHO Secretariat:

The HSSC Chair and IHO Secretariat thank Malaysia for their comments.

SWEDEN (Vote for adoption = YES)

Sweden proposes to clarify that Production Specifications for ECDIS use must provide a LUA Portrayal Catalogue, if portrayal is required. The clarification is needed as a direct consequence of making XSLT portrayal optional for ECDIS implementation in S-98 ed.3.0.0. It should be clarified that this imposes a requirement to provide a Lua portrayal catalogue for product specifications that are used in ECDIS. Additional clarification is proposed in S-97 section B-14:

S-100 defines an XSLT-based portrayal mechanism in Part 9. Edition 4.0.0 added the LUA scripting language as a second portrayal mechanism and defines a standard mechanism for including scripting support in S-100 based products. Developers/OEMs may prefer LUA due to promises of performance and similarity

to common programming languages. For product specifications that require portrayal in ECDIS, a Lua portrayal catalogue needs to be supplied, as the implementation of XSLT based portrayal is optional in S-98 edition 3.0.0.

Comments by the S-100 Working Group Chair, the HSSC Chair and IHO Secretariat:

The HSSC Chair and IHO Secretariat thank Sweden for their comments and take note of their remark.

S-98, Ed. 3.0.0	**PRODUCT SPECIFICATIONS**

AUSTRALIA (Vote for adoption = YES)

CO[1]	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph/ Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**[2]	**Comment (justification for change) by the CO**[3]	**Proposed change by the CO**
AU	11.5.1		te	3rd paragraph is about 'non official data' not about 'areas without ENC presence'.	Recommend moving the paragraph at the end of 11.5.2 and **alter the wording to read**: An indication that the mariner must refer to the official chart must ~~also~~ be given whenever line style NONHODAT appears on the display. ~~or whenever the display is comprised of other than ENC data as specified by clause 8.1.1.~~ The text in red seems unnecessary as the legend for when an ENC is not present on the ECDIS display is already specified in the 2nd paragraph as "No ENC Available".
AU	11.5.2		te	There's a requirement for ECDIS to display a legend to instruct mariners to '*refer to an official chart*' **but,** contrary to S-52, the wording of these legends is not specified here.	Specify the wording of the indication to be used when non-official data is displayed – Refer to S-52 Main document (2.3.1c[2]) for consistency. Recommend replacing '**RNC or paper chart'** with '**chart'**: "Unofficial data displayed; refer to official ~~RNC or paper chart~~ chart" **OR** "No official data available; refer to official ~~RNC or paper chart~~.chart."

					These legends should be added after the amended paragraph listed in the previous row.
AU	11.5.3		te	Missing details on how **non-ENC**, **non-official** product boundaries are to be shown on the ECDIS display when loaded. The section seems to focus on the display of their boundaries in a 'graphical index'.	Recommend that **all** non-official product types are treated the same way (use of NOHODAT and relevant textual indication [see entry above for 11.5.2]). For non-ENC products, the standardised legends/indication to be displayed on ECDIS could use the word '**product**' instead of '**chart**'. "Unofficial data displayed; refer to official ~~RNC or paper chart~~ product" **OR** "No official data available; refer to official ~~RNC or paper chart~~.product"
AU	11.9.10.1		te	Depth accuracy for hydrographically relevant S-101 features (e.g. sounding, wrecks, rocks, etc) are currently being 'brought back', by the S101PT, as a feature attribute (SOUACC) instead of having the features to refer to SpatialQuality via an spatial association to retrieve this information.	We believe this change should simplify real-time calculations by ECDIS and therefore we should consider factor in S-101 vertical accuracies within the 'extended corridor' when 'Uncertainty' selector is switched ON and S-102 is not present or is present but with no vertical accuracy encoded.
AU	11.9.10.2		ed	Need new figure showing area extensions when S-101 and S-102 overlap.	Should include a couple of **QualityOfBathymetryCoverage** polygons(S-102) partially overlapping an S-101 **QoBD** feature and show how the 'area extensions' change when both datasets overlap. _ **Refer to attachment for a graphical example.** It may be beneficial swapping 11.9.10.3 & 11.9.10.2 around.
AU	11.11.6			The title of this section is confusing/misleading. The term 'non official' is already used in S-98 for other purposes and therefore should not be referred to in this section.	1. Review the need for this section and, if required, a new title is extremely recommended to avoid confusion with terminology already in use. 2. Should ECDIS allow the installation of products containing non-conformant

				Non official – refer to 8.1.1 They can be S-57, S-101 or any other. This section seems to refer to data that is not compliant with any S-100 product specification and can be loaded onto the ECDIS display screen. In S-52, 'non-ENC' data refers to object classes that are not included in the S-57 PS. The default symbology for them is QUESMRK1. This is probably now handled by S-101 PC for ENCs. This section is probably trying to cover the use of non-conformant objects in other PS but not sure the proposed symbology (currently used for 'additions' done via 'manual updates') is the best option.	object classes/attributes? What are valid use cases for this? If required, consider replacing CHCRID01 with QUESMRK1. This seems more appropriate as it is already in use in S-52 and S-101.
AU	14.3.1	2nd paragraph	te	Conflicting messaging - Final sentence of the 2nd paragraph seems to leave up to OEMs how to implement the 'sorting method for the display of pick report results' while the instructions outlined at the beginning of the paragraph use MUST …...	What is the reason for this last sentence? AHO believes the use of the term "must" should be reconsidered here. Either the OEM's implement the sorting order as outlined at the beginning of the paragraph using MUST or they do not (and all guidance is to be given using 'should').
AU	19.3.2	2nd paragraph	te	The way to resolve overlaps between S-102s and S-104 is also explained in D-1.2(2.) & D-2.2(1.) but instead of instructing OEMs to 'select' one they direct OEMS to give the end user the option which one to load.	Make sure instructions are consistent all across the document.
AU	19.3.2	2nd paragraph	te	OEMs should consider the producer code of the overlapping S-101 ENC when making the call what overlapping S-102s wins. Same principle should be followed when resolving overlapping S-104s (OEM should consider the producer code of the 'winning' S-102 and S-101 products in the area). If overlapping S-102 or S-104 do not belong to the same S-101 producer, they should be ignored (refer to previous Row for an exception).	Instruct OEMs to prioritise the producer of the overlapping S-101 ENC when deciding what S-102 and/or S-104 wins (when there are overlaps between same product types from <> producers to resolve).
AU	B-1		te	Mariners should be alerted that they are about to (or they have just) install a "non-official" Product.	Recommend adding an additional SSE code with a description similar to the one below:

					Warning: Dataset <dataset name> is from a non-official source. Carefully consider the need to [continue with the installation} or [retain it in the system]. Ideally, this should happen before proceeding with the installation and give the user the option (dialogue box) to continue or not.
AU	Table B-1		ed	Missing row for 'SSE138'	Add entry (row) in Table B-1 or remove reference to this error message in B.2

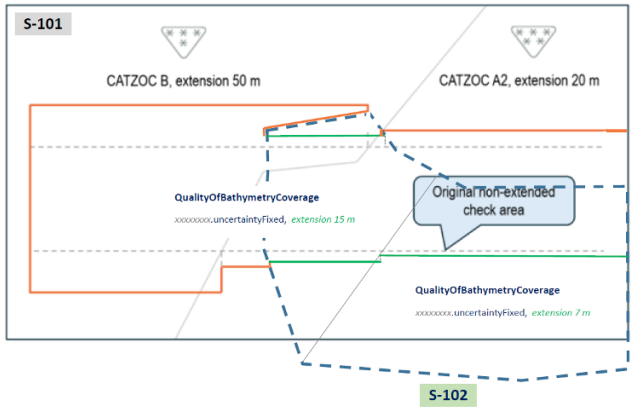
Comments by the S-100 Working Group Chair, the HSSC Chair and IHO Secretariat:

The HSSC Chair and IHO Secretariat thank Australia for their comments and take note of their remark. The following changes have been made to the S-98 edition 3.0.0 in response to these comments and discussion between the S100WG, S98PT Chair and AU. Further clarifications are possible within the S98PT meetings. It is also noted that some of these remarks will be considered by the S98PT for future clarification and revision:

11.9.10.2 – New image inserted as illustration. Also, image caption has been added.

11.9.10.2 Check area extension value – S-102 depth substitution

When the depth information in the S-101 is substituted by S-102 the *zoneOfConfidence.horizontalPositionUncertainty.*uncertaintyFixed in the **QualityOfBathymetryCoverage** feature attribute table (S-100 Part 10c, 9.6.2) from the S-102 must be used instead of the S-101 feature information as defined in the last clause if it is set. If this value is not available then the S-101 value defined in the previous clause must be used instead.



Area extension when S-101 & S-102 overlap

11.11.6 – Title changed to S-57 Manual Chart Updates

11.11.6 S-57 Manual Chart Updates

Non-official data added to existing official ENC data to augment the chart information must be distinguished from the official information as follows:

Point feature: Superimpose symbol CHCRID01.

Curve feature: Overwrite with line style CHCRID01.

Surface feature: Overwrite area boundary with line style CHCRID01 and superimpose symbol CHCRID01 on any centred symbol.

Non-official data must be distinguished from manually updated chart information, which uses the same identifiers, by cursor picking.

Non-official chart information may be updated by any systematic procedure. A record of updates must be maintained.

The mariner must be able to remove all non-official chart information if the need should arise.

14.3.1 – Deleted second paragraph.

14.3.1 Sorting order of results

The Pick Report must be organized to facilitate navigation through complex reports in a manner logically consistent with the layering presented on the screen.

14.3.2 Hover-over function

Appendix B-2 SSE138 has been added to the table.

SSE137	No Data Producer digital signature is present for dataset <filename>
SSE138	A fileless cancellation has no cancellation signature contained in the dataset discovery metadata

Table B-1 - Error codes and messages

CANADA (Vote for adoption = YES)

11.12.2 Default classification - Canada appreciates retention of the requirement for ""On chart"" to be the default classification for NAVWARNs. This ensures newly received warnings remain visible unless deliberately reclassified or filtered by the mariner and supports established MSI operational practices.

11.12.4 Retention of datasets - Canada recommends reducing the retention period specified in 11.12.4 to approximately three months. Canadian NAVAREA and coastal warning services routinely manage large volumes of navigational warnings. Extended retention periods may result in excessive accumulation of historical messages, reducing usability and increasing the effort required for mariners to identify operationally relevant information. A three-month retention period would provide adequate access to recent warning history while supporting effective information management and reducing user interface clutter.

Appendix C Completeness Function - Canada appreciates recognition of S-124 as an operational service through its inclusion in update status and completeness management functions. This supports the need for user interface requirements that provide a consistent operational experience independent of manufacturer-specific implementations.

Comments by the S-100 Working Group Chair, the HSSC Chair and IHO Secretariat:

The HSSC Chair and IHO Secretariat thank Canada for their comments and take note of their remark.

GREECE (Vote for adoption = YES)

Greece votes YES concerning approving Edition 3.0.0, recognizing the fundamental necessity of the S-98 specification for the advancement of the S-100 ECDIS framework and ensuring a smooth transition to dual-fuel systems. However, we consider that a technical resolution of specific operational ambiguities introduced in this edition, which directly impact the Safety of Navigation and the coordinated structure of the GMDSS system is essential. We request that the following technical comments and conditions be formally recorded and addressed by the relevant Working Groups during the upcoming maintenance cycle:

Spatial Overlap Resolution for Safety-Critical Data (Clause 11.2.1):

Safety-critical operational layers affecting the safety of life at sea, such as S-124 Navigational Warnings, cannot be subject to manual user selection or generic software automated filters when spatial provider overlaps occur. Navigational warnings must remain completely unambiguous.

Recommendation: In all cases of geographic overlap involving safety-critical data layers, the ECDIS must inherently prioritize and render the data issued exclusively by the internationally recognized and authorized national coordinator/producer for that specific geographic area of responsibility. The system's user interface must not permit the visual suppression or replacement of official safety messages from the authorized area coordinator in favor of an overlapping, unauthorized layer.

Data Ownership and Control of S-102 Layers (Appendix D, Clause D-1.2):

High-resolution bathymetric data (S-102) is utilized for the dynamic recalculation of the safety contour (Enhanced Safety Contour) in approach areas, mainly within waters under national jurisdiction.

Recommendation: To prevent legal and operational liabilities (liability issues), the processing and rendering of S-102 layers within these zones must rely solely and exclusively on datasets officially issued by, or under the explicit authority of, the relevant coastal State's hydrographic office.

Message Filtering (Clause 11.12.2) and Non-Official Information (Clause 11.11.6):

The ability to hide S-124 messages as ""Off chart"" via automated route-proximity filters risks depriving the vessel of vital hazard awareness in case of unpredicted altering of the original passage plan. Additionally, allowing non-official third-party data to overwrite official area boundaries can degrade screen clarity.

Recommendation:

The provisions must be amended to require that:

a) The ECDIS maintains a permanent, prominent on-screen warning indicator whenever active S-124 data within the vessel's vicinity is suppressed by filters.

b) Non-official information must never subvert, obscure, or visually replace (overwrite) any component of the Display Base or Standard Display of official ENC datasets.

Finally Greece notes that the specific technical requirements regarding overlap resolution, mandatory message filtering, and dynamic clearance calculations are introduced as mandatory standards for the first time in Edition 3.0.0. Due to their high-risk nature, these provisions lack operational maturity. It is strongly recommended that these features undergo extensive sea trials and field testing within S-100 testbeds before becoming mandatory for type-approved systems.

Comments by the S-100 Working Group Chair, the HSSC Chair and IHO Secretariat:

The HSSC Chair and IHO Secretariat thank Greece for their comments and take note of their remark.

INDONESIA (Vote for adoption = YES)

Pushidrosal approves the proposed Edition 3.0.0 of S-98 and welcomes the enhanced interoperability framework for S-100 ECDIS.

Comments by the S-100 Working Group Chair, the HSSC Chair and IHO Secretariat:

The HSSC Chair and IHO Secretariat thank Indonesia for their comment.

MALAYSIA (Vote for adoption = YES)

Malaysia approves S-98 as it supports interoperable S-100 ECDIS implementation, consistent data portrayal, validation, dual-fuel operation and navigational safety requirements.

Comments by the S-100 Working Group Chair, the HSSC Chair and IHO Secretariat:

The HSSC Chair and IHO Secretariat thank Malaysia for their comment.

SWEDEN (Vote for adoption = YES)

Sweden would like to commend the S-100WG and the S-98 Task Group for this outstanding achievement, and would also like to thank IC-ENC and PRIMAR and its members for their financial support in the development of this edition of S-98. Edition 3.0.0 of S-98 is essential in order to be able to build and type approve of the first S-100 ECDIS systems.

Comments by the S-100 Working Group Chair, the HSSC Chair and IHO Secretariat:

The HSSC Chair and IHO Secretariat thank Sweden for their comment.

UNITED KINGDOM (Vote for adoption = YES)

The UK congratulates the S-100WG on the progress made to complete S-98 and achieve a significant milestone for S-100 ECDIS.

Noting discussion at HSSC18 on the issue of depth substitution. the UK continues to have concerns that there is not yet guidance for producers to ensure that datasets being produced and distributed take this fully into account. We note planned work to reflect this in S-165 in future and request that this is treated as a high priority.

Comments by the S-100 Working Group Chair, the HSSC Chair and IHO Secretariat:

The HSSC Chair and IHO Secretariat thank United Kingdom for their comment. Changes made to S-98 in response to other comments may well help to address this issue within the current edition, but it is noted that future revisions to S-98 may well revise this further.

IHO SECRETARIAT

During discussions held at HSSC18 and as a result of Papers submitted to the recent S-102PT, S-100WG11 (September 2026) and ENCWG11/S-101PT18 (October 2026) meetings, concerns were raised as to the complete substitution of S-101 depths and bathymetry with S-102 gridded bathymetry in S-100 ECDIS, as specified in S-98 Appendix D, Section D-3.

As a result of discussion on these concerns at the ENCWG11/S-101PT18 meeting, it has been agreed to add a new enumeration type attribute for S-101 Edition 2.1.0 that will allow the Data Producer, at their discretion, to override the S-102 depth substitution, as documented in S-98, within their ENCs.

In order for this new attribute to be recognized and the intended S-100 ECDIS performance outcome to be implemented, updates are required in S-98 Appendix D to describe the implementation, restricting the depth substitution to those features in D-3.1, for which the new enumerate is not defined.

Due to the requirement for S-98 to be stabilized at Edition 3.0.0 for an extended period in order to provide OEMs with a stable platform from which to develop their implementations, it is requested that this guidance is included in S-98 Edition 3.0.0.

Comment by the S-98 Sub-Group Lead, S-100WG Chair and HSSC Chair:

The S-98 Sub-Group Lead, S-100WG Chair and HSSC Chair thank the IHO Secretariat for their comment. After discussion amongst all parties, and additional input from IHO Technical Director Dr. John Nyberg, it has been agreed to include this new guidance in S-98 Edition 3.0.0. This decision has been made in order to mitigate a genuine concern raised by IHO Member States; and to avoid the requirement of including this change in a Revision (3.1.0) of S-98 in a short timeframe after publication of Edition 3.0.0 in order for the new attribute included in Edition 2.1.0 of S-101 to be implemented in S-100 ECDIS.

The revised requirement in S-98 Appendix D is as follows:

D-3 Treatment of depth and water level related S-101 features

D-3.1 Substitution and adjustment of depth values

In areas covered by only S-102, defined (not "Unknown") depth values must be substituted for all ENC features which have depth attribution (that is, the attribute *valueOfSounding* bound to them in the S-101 Feature Catalogue or the z value(s) of Sounding features), when viewed at a MSVS that is larger than or equal to the *minimumDisplayScale* of the overlapping S-102 dataset. All features with defined depth values must be substituted except for those features for which the S-101 attribute *depthSubstitution* is defined with value *disableDepthSubstitution*.

In areas where WLA is processed, all defined (not "Unknown") depth values must be adjusted for all ENC features which have depth attribution (that is, the attribute *valueOfSounding* bound to them in the S-101 Feature Catalogue or the z value(s) of Sounding features), including those for which the S-101 attribute *depthSubstitution* is defined with value *disableDepthSubstitution*.

D-3.2 **Areas covered by S-102 only or by both S-102 and S-104**

Adjustment of different geographic primitives. In (1) and (2) S-102 substitution is applied unless specifically excluded by the conditions in D-3.1

1. Point Features
    - For Areas covered by S-102 only, a value for the attribute *valueOfSounding* must be taken from the S-102 grid cell extents which intersect the point feature (as shown in Figure D-3-18)
    - For Areas covered by S-102 and S-104, the value for attribute *valueOfSounding* must be taken from the S-102 grid cell extents which intersect the point. WLA is then applied to this value using S-104 records selected from the S-104 grid cell intersecting the point feature. The S-104 value selected is as defined in clauses D-2.5, D-2.6 and D-2.7.
    - If depth substitution is excluded by the conditions in D-3.1 then the defined (not "Unknown") S-101 depth value is used for WLA adjustment.
2. Curve and Surface features
    - For Areas covered by S-102 only, the value for *valueOfSounding* must be the shoalest value of all S-102 grid cells whose extents intersect the feature's geometry within the S-102 coverage available. If the curve or surface feature is not completely within the S-102 then the value defined is the shoalest resulting from the original feature value in S-101 attribute and the value selected from the intersecting S-102 grid cells.
    - For Areas covered by S-102 and S-104, the value for *valueOfSounding* is first selected, as the shoalest value of all S-102 grid cells whose extents intersect the feature's geometry. WLA adjustment must then applied to this value by selecting the shoalest value from all intersecting S-104 grid cells. The value selected is as defined in clauses D-2.5, D-2.6 and D-2.7 and shown in Figure D-3-19. If the curve or surface feature is not completely within the S-104 coverage then the adjusted value is the shoalest value resulting from the original feature value in S-101 attribute and the WLA adjusted value.
    - If depth substitution is excluded by the conditions in D-3.1 then the defined (not "Unknown") S-101 depth value is used for WLA adjustment.

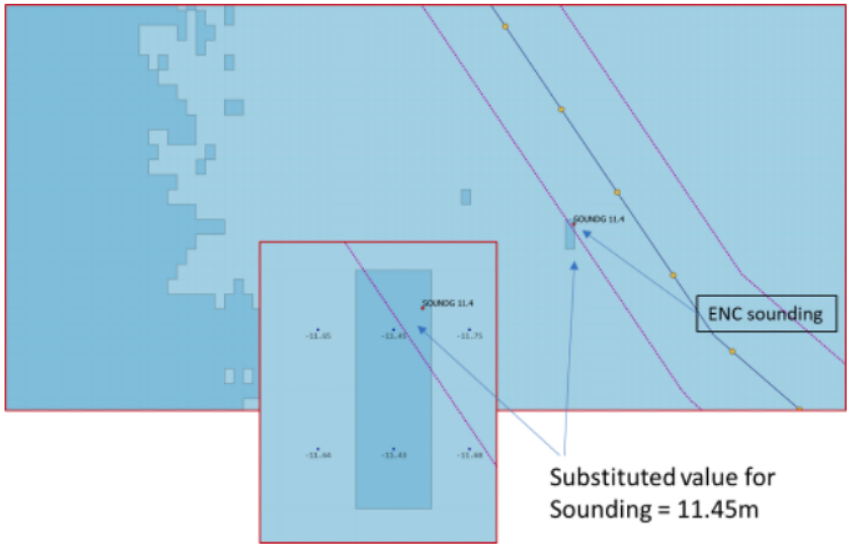


Figure D-3-18 - Substitution of sounding value from S-102

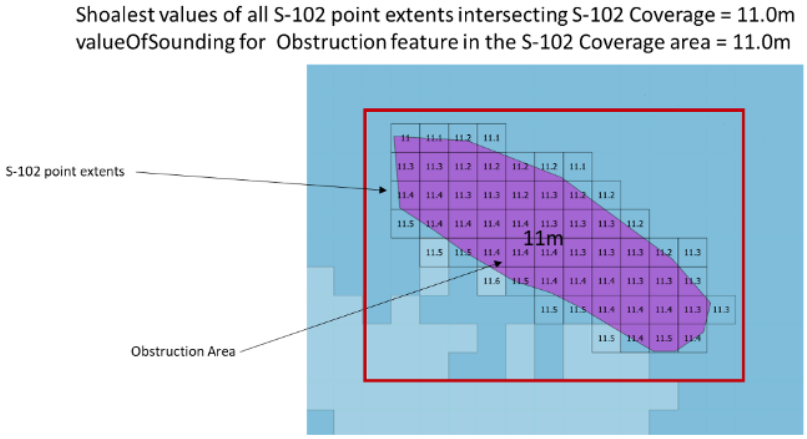


Figure D-3-19 - Substitution of *valueOfSounding* attribute in S-101 Obstruction from S-102 data

The S-101 features for which this depth substitution must be implemented within S-102 coverage areas are all those which bind *valueOfSounding* in the S-101 feature catalogue along with multipoint geometries, unless specifically excluded in this clause.

Soundings are included (either individual soundings or those which are part of an array) substituting the S-102 grid cell whose extents intersect the sounding position for the defined ZCOO (ISO8211), See figure D-3-18 unless specifically excluded in this clause.

If the depth substituted S-101 feature is covered by S-104, then WLA must be processed using the same method as for the underlying depth area.

For all features with substituted (and possibly adjusted values), the ECDIS Pick Report must indicate the substituted/adjusted value and its source. The format and portrayal of depths and drying heights (that is

S-164, Ed. 2.0.0	PRODUCT SPECIFICATIONS

AUSTRALIA (Vote for adoption = YES)

Refer to the file provided for details.

Comments by the S-100 Working Group Chair, the HSSC Chair and IHO Secretariat:

The HSSC Chair and IHO Secretariat thank Australia for their comments.

CANADA (Vote for adoption = YES)

S-164 currently provides conformance tests for manual filtering functions but appears not to verify the behaviour of automatic filtering mechanisms referenced in S-98. Consider whether additional test scenarios are required to ensure consistent implementation where automatic filtering is supported.

Comments by the S-100 Working Group Chair, the HSSC Chair and IHO Secretariat:

The HSSC Chair and IHO Secretariat thank Canada for their comment.

INDONESIA (Vote for adoption = YES)

Pushidrosal approves the proposed Edition 2.0.0 of S-164 and supports its adoption as a reference for developing S-100 datasets.

Comments by the S-100 Working Group Chair, the HSSC Chair and IHO Secretariat:

The HSSC Chair and IHO Secretariat thank Indonesia for their comments.

MALAYSIA (Vote for adoption = YES)

Malaysia approves S-164 because it enables standardised ECDIS testing, verifies S-100 interoperability, supports dual-fuel implementation, and strengthens navigational safety assurance.

Comments by the S-100 Working Group Chair, the HSSC Chair and IHO Secretariat:

The HSSC Chair and IHO Secretariat thank Malaysia for their comments.