

Paper for Consideration by NCWG

New Symbols for S-101 Anchorage Areas

Submitted by:	United States (NOAA)
Executive Summary:	Symbols for the portrayal of several S-101 Anchorage Area categories are proposed for consideration by NCWG to subsequently recommend for adoption by the S-101 Project Team.
Related Documents:	<ul style="list-style-type: none"> • NCWG9-05-14,A, “S-101 Portrayal Proposals,” submitted by the Australian Hydrographic Office, S-101 Portrayal Sub-Working Group Lead • NCWG9 (Nov 2023 – Taunton) Meeting Minutes and Actions • S-4, Sections B-431.1, B-431.3, and B-431.7 • S-65, Annex B, S-57 ENC to S-101 Conversion Guidance, Edition 1.2.0 – April 2024 • S-101 ENC Product Specification, Annex A, Data Classification and Encoding Guide (DCEG), Edition 1.2.0 – November 2023 • IHO Geospatial Information Registry, IHO Hydro Portrayal Register
Related Projects:	<p>Development of S-101 ENC portrayal in ECDIS</p> <p>S-4 Document maintenance</p>

Introduction / Background

This paper fulfils **NCWG ACTION 9/15**, “US volunteered to review the S-4 content regarding anchorage symbols and consider the requirements for new symbols [for S-101] for the categories that would require a specific symbol.”

Refining the portrayal of the various types of anchorage areas was suggested by the S-101 Portrayal Sub-Working Group, which brought the issue to NCWG in the paper, [NCWG9-05-14,A](#), “S-101 Portrayal Proposals.” The general consensus at NCWG9 was that if there was a suitable symbol that could be used to augment the existing generic S-101 anchorage symbol, this would help to more readily identify the type of anchorage for the mariner and reduce the need for a pick-report. IHO INT1 Sections F “Ports” and N “Areas, Limits,” as well as relevant sections of S-4 and the S-101 Data Classification and Encoding Guide (DCEG) were reviewed to identify all the anchorage area types and to evaluate potential symbols to be used to enhance the portrayal of S-101 anchorage areas.

Analysis/Discussion

All eleven *category of anchorage* attribute values identified in the S-101 DCEG for Anchorage Area were evaluated for possible augmented symbology.

Table 1. S-101 category of anchorage attribute values

1: unrestricted anchorage
2: deep water anchorage
3: tanker anchorage
5: quarantine anchorage
6: seaplane anchorage
7: small craft anchorage
9: anchorage for periods up to 24 Hours
10: anchorage for a limited period of time
14: waiting anchorage
15: reported anchorage [point only]

S-4, Section B-431.3 shows unique symbols corresponding to categories 1, 2, 3, 5, and 9 – marked in bold text in Table 1. These categories correspond to the S-4, INT1 symbols for anchorage areas, N12.1, N12.4, N12.5, N12.8, and N12.6, respectively, as shown in Figure 1.

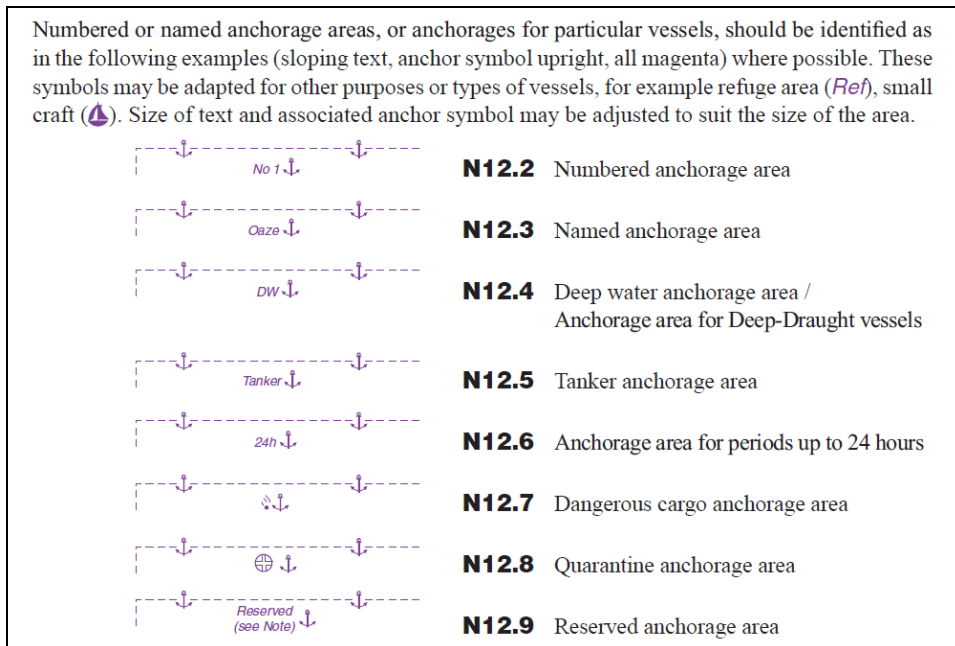


Figure 1. S-4, Section B-431.3 showing symbols for various types of anchorages

The DCEG lists 15 *category of cargo* attribute values. Only #7: *dangerous or hazardous*, which S-101 uses instead of the S-57 CATACH value #4: *explosives anchorage*, was considered for augmented symbology. This corresponds to S-4, INT1 symbol N12.7 shown in Figure 1.

Table 2. S-101 category of cargo attribute values

1: bulk
2: container
3: general
4: liquid
5: passenger
6: livestock
7: dangerous or hazardous
8: heavy lift
9: ballast
10: dry bulk cargo
11: liquid bulk cargo
12: reefer container cargo
13: Ro-Ro cargo
14: project cargo
15: break bulk cargo

The DCEG lists 9 *status* attribute values. Only #6: *reserved*, was considered for augmented symbology. This corresponds to S-4, INT1 symbol N12.9 shown in Figure 1.

Table 3. S-101 status attribute values

1: permanent
2: occasional
3: recommended
5: periodic/intermittent
6: reserved
7: temporary
8: private
9: mandatory
14: public





The augmented symbols shown in the “Proposed S-101 Centred Symbol” column of Table 4 were derived from the symbols shown in the “Symbol Source” column. Additional information is provided in the S-101 Encoding, INT1, and S-4 Section columns. Notes shown below the table provide more information about the lineage of each augmented symbol.

Proposed symbol component sizes generally conform with those specified in engineering drawings in the S-52 Presentation Library Addendum and the IHO Hydro Portrayal Register for S-101 symbols. For example, the centred anchorage area symbol (ACHARE51) is 13.04 mm high and the diameter of the circle enclosing the dangerous cargo symbol (ANCB DNG2) is 5.0 mm. The engineering drawings for each are shown in Annex B. These sizes were used as a model for all other augmented symbols. That is, all of the secondary symbols are 5.0 mm high (even if S-52 or the S-101 Portrayal Register specifies a slightly different height) and the main ACHARE51 symbol is 13 mm high. The text labels shown in the proposed symbols is also 5.0 mm high (about 14-point text). This is acceptable for short labels, such as *DW*, *24 h*, and *No.1*, but a smaller text size might be considered for the *TANKER*, *RESERVED*, and *NAME* labels, lest the text extend too far and contribute to clutter.



An example of the relative symbol component sizes is shown at true scale in Figure 2. Unlike paired point symbols, such as those used for anchorage berth for dangerous cargo, which places two similar size symbols side-by-side, we recommend that for areas, the smaller, secondary symbol be placed to the upper left of the larger main symbol. Besides the larger size of the main symbol, this placement can also help to differentiate these paired symbols as portraying an area and not a point.



Figure 2. Dangerous/hazardous anchorage area centred symbol

Table 4 only shows proposed symbols for anchorage areas to augment the generic centred anchorage  symbol. The same logic could be applied to augment the anchor berth  (ACHBRT07) symbol, as has already been done for the anchorage berth for dangerous cargo   (ANCB DNG2) symbol.

There is a hierarchy or logic that must be developed for some symbols that do not depend on the category of cargo attribute value.

- If an anchorage category of cargo = 7: dangerous or hazardous, then would make sense that the  symbol would always be used regardless of any other attribution?
- A determination needs to be made as to when the reserved  symbol should be used, if the anchorage status = 6: reserved. Given the other types of anchorage areas, when, if ever, should the reserved label be used instead of the other secondary symbols?
- A determination needs to be made as to when, if ever, an anchorage's name or number should be displayed instead of one of the secondary symbols. Would display of the label only be acceptable if category of anchorage = unrestricted anchorage?

Conclusions

INT1 symbols specified in S-4 and symbols in the IHO Hydro Portrayal Register provide acceptable symbol components to join with the existing anchorage area centered symbol, ACHARE51 to create augmented symbols suitable to more definitively portray various types of anchorage areas. A new “clock” graphic could also be a useful addition as a secondary symbol.

Recommendations

The NCWG should consider the proposed augmented symbols for portraying S-101 anchorage areas, shown in Table 4., and make recommendations to implement these or modified versions of these symbols by the S-101 Portrayal Sub-Working Group. NCWG should also consider the utility of adopting a clock graphic to identify areas for anchorage “for a limited period of time,” other than 24 hours, and for “waiting anchorages.”

The balance between legibility and potentially long text strings contributing to clutter in the chart display should be considered and an appropriate text size for the Tanker, Reserved, and Name labels should

The S-101 Portrayal Sub-working Group should consider the merits of using the proposed augmented symbols anchorage areas and analogous application for anchorage berths. The sub-working group should also establish the hierarchy or logic to be applied for use of the reserved anchorage symbol and for the display of anchorage numbers or names.

Justification and Impacts

Adopting augmented symbols for the portrayal of S-101 anchorage areas will make the purpose of various anchorages more apparent to mariners and provide more uniformity with the symbols used on paper charts.



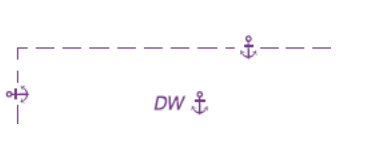

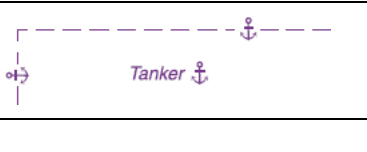











Action Required of NCWG









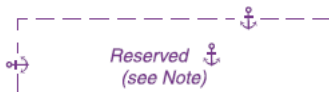



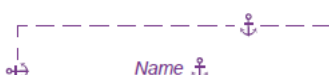

The NCWG is invited to:

- a. note the paper and follow the recommendations noted above, which include,
- b. considering the proposed augmented symbols for portraying S-101 anchorage areas, and anchorage berths shown in Table 4. and make a recommendation to the S-101 Portrayal Sub-Working Group to implement these or modified versions of these symbols,
- c. and considering the addition of a clock symbol component in S-4 to portray areas for anchorage “for a limited period of time,” other than 24 hours, and for “waiting anchorages” on paper charts.

Annex A – Proposed New Symbols

Table 4. Proposed augmented symbols for various types of anchorage areas

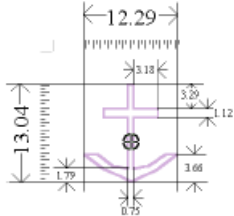

Note	S-101 Encoding	INT1	S-4 Section	INT1	Proposed S-101 Centred Symbol	Symbol Sources
1,7	anchorage area category of anchorage = 1 unrestricted anchorage	N12.1 Anchorage area in general	B-431.3			ACHARE51 Anchorage area
1,4	anchorage area category of anchorage = 2 deep water anchorage	N12.4 Deep water anchorage area, Anchorage area for deep draft vessels	B-431.3			ACHARE51 + DWRTP51 Part of deep water route
1,4	anchorage area category of anchorage = 3 tanker anchorage	N12.5 Tanker anchorage area	B-431.3			ACHARE51 + text
1	anchorage area category of anchorage = 5 quarantine anchorage	N12.8 Quarantine anchorage area	B-431.3			ACHARE51 + INT1 N12.8 Quarantine anchorage area
2	anchorage area [POINT] category of anchorage = 6 seaplane anchorage	N14 Anchorage for seaplanes	B-449.6			ACHARE02 + INT1 N14 Anchorage for seaplanes
2	anchorage area category of anchorage = 6 seaplane anchorage	N13 Seaplane operating area	B-449.6			ACHARE51 + INT1 N13 Seaplane operating area
3	anchorage area category of anchorage = 7 small craft anchorage	F11.1 Boat harbour, Marina				ACHARE51 + SMCFAC02 Yacht harbour, marina
4	anchorage area category of anchorage = 9 anchorage for periods up to 24 Hours	N12.6 Anchorage area for periods up to 24 hours				ACHARE51 + text

5	anchorage area category of anchorage = 10 anchorage for a limited period of time	None	None	None		ACHARE51 + clock
5	anchorage area category of anchorage = 14 waiting anchorage	None	None	None		ACHARE51 + clock
7	anchorage area [POINT] category of anchorage = 15 reported anchorage	N10 Reported anchorage (no defined limits)	B-431.1			ACHARE03 Reported Anchorage
7	anchorage area [POINT] category of anchorage = 1 unrestricted anchorage	N10 Reported anchorage (no defined limits)	B-431.1			ACHARE02 Anchorage area as a point at small scale
1	anchorage area category of cargo = 7 dangerous or hazardous	N12.7 Dangerous cargo anchorage area	B-431.3			ACHARE51 + BRTHDNG2 Dangerous or Hazardous Cargo
1,4,	anchorage area status = 6 reserved	N12.9 Reserved anchorage area	B-431.3		<i>RESERVED</i> 	ACHARE51 + text
6	anchorage area category of anchorage = unrestricted anchorage name <> NULL	N12.2 Numbered anchorage area	B-431.3		<i>No. 1</i> 	ACHARE51 + name
6	anchorage area category of anchorage = unrestricted anchorage name <> NULL	N12.3 Named anchorage area	B-431.3		<i>NAME</i> 	ACHARE51 + name

Notes:

1. Based on existing S-4 INT1 symbol for the same feature.
2. Based on an existing S-4 INT symbol for a related feature (seaplane operating area > sea plane anchorage area).
3. Based on an existing S-4 INT symbol for a related feature (marina > small craft anchorage area).
4. Text based symbols
5. New graphic "clock" symbol
6. Placement of object name attribute label could be used to replicate the INT1 symbol
7. These S-101 symbols already exist. They are included here for the sake of completeness.

Annex B – Engineering Diagrams

<p>Symbol Name: SY(ACHARE51) RN: 2</p>	
<p>Symbol Explanation: anchorage area</p>	
<p>Look up table affected: area symbols with plain boundaries area symbols with symbolized boundaries</p>	
<p>Pivot Point Column: 6.29 Pivot Point Row: 7.79</p>	
<p>Width of Bounding Box: 12.29 Height of Bounding Box: 13.04</p>	
	
<p>Symbol Colours: CHMGF</p>	
<p>Comments: Line weight 0.3 mm</p>	
<p>Examples on ENC: N/A</p>	
<p>References:</p>	
<p>S57</p>	<p>INT 1</p>
<p>ACHARE (centred symbol)</p>	<p>N 12.1-9 (N 12.1)</p> 

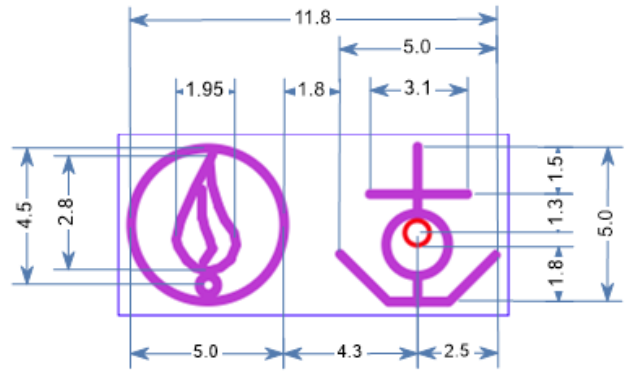

Symbol name	ANCBPNG2
Symbol Explanation	Anchorage berth for dangerous cargo
Look up table affected	
Pivot point (x,y)	(0,0) Red circle shows the pivot point and is not part of the end portray.
Width of Bounding Box:	6.06
Height of Bounding Box:	12.86
Symbol Details:	
Symbol Preview:	
Symbol Colours:	CHMGD
Comments:	Lines stroke widths 0.32, Flame base circle size 0.58, Anchor circle 2.02.
Examples on ENC:	
References:	Based on ACHBRT07 and BRTHPNG1 (scaled down)

Figure 3. Engineering drawings for S-52 symbol ACHARE51 and S-101 symbol ANCBPNG2