

## Paper for Consideration by ENCWG5

## Amendments to ENC Validation Checks

<b>Submitted by:</b>	Australia (AHO)
<b>Executive Summary:</b>	This paper outlines a number of proposals to amend existing S-58 validation checks.
<b>Related Documents:</b>	S-58 Ed 6.1.0
<b>Related Projects:</b>	S-101PT

## Introduction / Background

A number of improvements to existing S-58 ENC validation checks have been identified by the AHO.

## Analysis/Discussion

## 1. Check 61b

61b	For each feature object of geometric primitive point where WATLEV is Equal to 3 (always underwater/submerged) which is not COVERED_BY a DEPARE feature object where DRVAL2 is Greater than 0 OR is COVERED_BY a LNDARE feature object of geometric primitive point or line.	Point object where WATLEV = 3 (always underwater/submerged) is not covered by a suitable depth area.	Amend value of WATLEV.	Logical consistency	E
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The existence of 'always underwater' objects within an UNSARE or DRGARE should not be reported as an ERROR. The existence of, for example, UWTRC, WATLEV=3 within unsurveyed areas is fairly common and the existence of features such as foul ground obstructions within dredged areas, although maybe not that common, cannot be ignored. Hence, reporting a Validation error message in these scenarios produce a number of 'false positives' that have a negative impact on the confidence users allocate to error messages.

The AHO proposes amending the wording of S-58's 'Check Description' and 'Check Message' to:

For each feature object of geometric primitive point where WATLEV is Equal to 3 (always underwater/submerged) which is not COVERED\_BY a DEPARE feature object where DRVAL2 is Greater than 0 OR a DRGARE OR UNSARE feature object OR is COVERED\_BY a LNDARE feature object of geometric primitive point or line.

Point object where WATLEV = 3 (always underwater/submerged) is not covered by a suitable depth area object.

The solution proposed by the AHO aims reducing the number of 'erroneous messages' reported by this check by expanding the objects listed in the 'is not COVERED\_BY' section of the check.

## 2. Checks 507, 508a and 508bb

507	If any mandatory attributes are not Present.	Mandatory attributes are not encoded.	Populate mandatory attributes (If unknown encode attribute with empty value).	3.5.2 and Supplement No.3 Ch.4 (3.5.2.1)	C
508a	For each feature object (excluding LIGHTS) where more than one value of COLOUR is encoded AND COLPAT is not Present OR is Null.	COLOUR has multiple values without a value for COLPAT.	Ensure COLPAT has a value where multiple COLOUR values are encoded.	3.5.2 and Logical consistency	E
508b	For each feature object where COLPAT is notNull AND COLOUR is Null OR only has one value.	COLPAT is populated without multiple COLOUR values.	Ensure multiple COLOUR values are populated or remove COLPAT value.	3.5.2 and Logical consistency	E

When an object (e.g. BCNxxx) has the attribute COLOUR populated with more than one value there is an expectation that the attribute COLPAT 'is Present' (has a meaningful value or is null (255)).

According to section 3.5.2 (incl. 1.C0.21) of the ENC PS, the attribute COLPAT is mandatory for any object (except LIGHTS) that has more than one colour. This statement makes existing Validation tools report a CRITICAL ERROR when this requirement is breached (see S-58 Check 507).

Once COLPAT is populated with a 'Null' value, the CRITICAL ERROR message disappears and is replaced by an ERROR (see S-58 Check 508a) instead.

Considering that having the attribute COLPAT unpopulated or encoded with a 'Null' value does not affect ECDIS display or performance, the AHO would like the ENCWG to consider the following changes to the following S-58 Checks:

- **Check 507** – Remove 'COLPAT is not Present' from the check's logic. This would avoid this situation being reported as CRITICAL (*An error which could make an ENC unusable in ECDIS through not loading; or causing an ECDIS to crash; or presenting data which is unsafe for navigation*).
- **Check 508a** – Amend as per table below.
- **Check 508b** – No change.
- **Add new check (508c ?)** – WARNING - Amend as per table below or swap 508b and 508c around..

No	Check description	Check Message	Check solution	Conformity to:	Cat
508a	For each feature object (excluding LIGHTS) where more than one value of COLOUR is encoded AND COLPAT is not Present <del>OR is Null.</del>	COLOUR has multiple values without a value for COLPAT.	Ensure COLPAT has a value where multiple COLOUR values are encoded.	3.5.2 and Logical consistency.	E
508b	For each feature object where COLPAT is notNull AND COLOUR is Null OR only has one value.	COLPAT is populated without multiple COLOUR values.	Ensure multiple COLOUR values are populated or remove COLPAT value.	3.5.2 and Logical consistency	E
508c	For each feature object (excluding LIGHTS) where more than one value of COLOUR is encoded AND COLPAT is Null.	COLOUR has multiple values without a meaningful value for COLPAT.	Review source information and allocate a meaningful value to COLPAT.	Logical consistency.	W

The proposed changes will not only avoid the erroneous categorisation (as per S-58 section 1.2) of an encoding situation as CRITICAL if not downgrade an ERROR message to a WARNING when the producer has consciously investigated and populated the attribute COLPAT with a Null value.

### **Conclusions**

S-58 Ed 6.1.0 can be improved by incorporating the changes proposed by the AHO.

### **Recommendations**

Discuss the merits of the changes proposed by the AHO and incorporate them into a new 'Revision' version (6.2.0) of S-58.

### **Justification and Impacts**

It is critical to continuously review and amend the content of our standards by incorporating lessons learnt and fixing shortfalls. This practice helps not only maintaining the IHO charting documents relevant if not retaining user's confidence by reducing the number of false positives and/or the severity of the error message reported.

### **Action Required of ENCWG**

The ENCWG is invited to:

- a. discuss the relevance of the changes proposed by the AHO and
- b. incorporate these changes into the next version of S-58