Paper for Consideration by ENCWG4

Mismatching Agency Code (AGEN) values in ENCs

Submitted by:	Australia (AHO)
Executive Summary:	Discuss the requirement of populating FOIDs and DSID with the same AGEN values.
Related Documents:	S-57 3.1.3_Main Document; S-57 Appendix B.1, Annex A (UOC) Ed 4.1.0; S-58 Ed 6.1.0
Related Projects:	S101PT

Introduction / Background

Some producers compile ENCs on behalf of other countries using the same production databases. Having different instances of a database to manage different FOIDs is not practical and therefore the agency component of a FOID end up being different from the code in the AGEN field of the cell name.

Analysis/Discussion

Australia became Solomon Islands' Primary Charting Authority (PCA) in July 2017. At that time, Australia's ministry of Foreign Affairs recommended publishing these ENCs using the 'SB' and not the 'AU' country code. The main reason for this was Solomon Is' midterm aspiration of depicting their maritime boundaries (claims) in 'their' products. Australia's policy is not to show other countries maritime claims in 'Australian (AU)' charting products.

With this in mind, the AHO looked at the most effective way of producing the ENCs for the Solomon Is using its existing production tools. One of the first things we did look at the IHO Standards and Specifications to determine if there were any technical roadblocks stopping us from using AU FOIDs in the SB ENCs. The AHO concluded that there was nothing in the IHO Standards or Specifications that strictly prohibit the use of a different agency code for FOIDs and DSID/Cell name. Despite this, 7Cs Analyzer and Dkart Inspector were both reporting 'Critical Errors' when DSID.AGEN and the FOID.AGEN did not agree (as per their interpretation of S-58 Ed 5.0.0 check 1518b). This result triggered further investigations because, by definition in S-52, a "Critical' error is '*An error which would make an ENC unusable in ECDIS through not loading; or causing an ECDIS to crash; or presenting data which is unsafe for navigation.* To discard the possibility of some ECDIS manufacturers having implemented any loading mechanism to check and stop the loading of ENCs with different AGENs (FOID vs DSID), the AHO decided to test the behaviour of as many of the most used ECDIS systems available in the market as possible. To do this, the AHO created a test ENC (SB cell name and AU FOIDs) and, in June 2016, we requested support from the UKHO and IC-ENC to load this test ENC into a range of ECDIS systems available to them.

The test ENC was loaded in 11 different ECDIS systems with no error messages reported. Based on this overwhelming result the AHO published, in July 2017, 46 SB ENCs with AU FOIDs. No problems have been reported by any stakeholders so far.

It is important to highlight that this case is not limited to the Salomon Islands. Australia has already embarked on a new project to reissue the ENCs covering Papua New Guinea's charting area of responsibility as 'PG' ENCs and other countries like New Zealand are keen to proceed the same way with the ENCs they produce on behalf of other South Pacific nations.

From a pure technical point of view, the AHOs' interpretation of each AGEN related S-58 check and the corresponding section of the Standard they refer to is:

S-58 check # 7: Is looking for <u>invalid</u> values only. The AHO's interpretation is that AGEN must be listed in S-62; FIND must be an integer number ranging 1 to 2^{32}-2 and FIDS must be an integer number ranging 1 to 2^{16}-2-2. This test is not designed to check if FOID AGEN and DSID AGEN subfields are identical!

7	For each feature object with invalid AGEN, FIDN or FIDS values.	Invalid values of AGEN, FIDN or FIDS.	Amend AGEN, FIDN or FIDS value.	Part 3 (4.3.1) and (4.3.2)	C
8	For each feature object	Duplicate attribute	Remove or amend	Part 3 (4.4), (4.5)	C

4.3.1 Producing agency [AGEN] subfield

The allowable values for the "Producing Agency" [AGEN] subfield are defined in the IHO Object Catalogue. The IHO Object Catalogue contains a 2-character acronym and a corresponding integer value for each agency. If the producing agency is not listed, the AGEN subfield must be encoded as a missing subfield value (see clause 2.1).

4.3.2 Feature Object identification number and subdivision [FIDN, FIDS] subfield

The "Feature Object Identification Number" ranges from 1 to $2^{32}-2$. The "Feature Object Identification Subdivision" ranges from 1 to $2^{16}-2$. Both subfields are used to create an unique key for a feature object produced by the agency encoded in the AGEN subfield. The usage of the FIDN and FIDS subfields is not constrained and must be defined by the encoder.

4.3.1: Any AGEN two character acronyms must be idefined in the IHO Object Catalogue (nowadays S-62).

4.3.2: The AHO is of the opinion that the original developers of S-57 envisaged that all countries would be producing their own products (they would manipulate the production tools that generate the ENC content - including FOIDs). That is why it says "… *Both subfields are used to create a unique key for a feature object produced by the agency encoded in the AGEN subfield'*. We now know that sometimes the 'authorizing agencies' are not the ones using the tools to produce the ENCs. In these cases, the FOIDs reflect the country code of the 'producer' (e.g. AU) not the 'charting authority' which two letter code is populated in the cell's name and the DSID AGEN field (e.g. SB).

In conclusion, none of these sections of the Standard (4.3.1 or 4.3.2) says that the FOID's AGEN and the DSID's AGEN subfields have to be the same. They have to be listed in S-62 but there is nothing enforcing them to be the same. The AHO understands that section 4.3.2 could be interpreted differently and therefore it should be clarified by adding a sentence at the end stating that there is no requirement for FOID AGEN and DSID AGEN subfields to match.

S-58 check #1008: This check is valid as it looks for consistency between an update and its base cell.

1008	For each ER (update) file where an AGEN subfield value of the DSID field or FOID field is not identical to the AGEN subfield values in the EN (base) file.	AGEN subfield values do not agree between ER (update) and EN (base) files.	Amend AGEN subfield values to agree.	Part 3 (4.3.1) and (7.3.1.1)	C

S-57 Appendix B.1, Annex A (UOC) (Ed. 4.1.0 – January 2018)

2.2.1   Production information

The Producing Authority of the ENC must be given in the cell file name and in the "Producing Agency" [AGEN] subfield of the "Data Set Identification" [DSID] field. The use of the meta object **M_PROD** is prohibited.

2.2.1: No problems here, DSID AGEN and country code in the cell's name have to match.

S-58 check #1518a: The AHO would like to discuss the removal of this check as it seems to do the same thing as check #7 (AGEN validity).

1518a	If the AGEN subfield of the DSID field is not one of the values listed in S-62 sections I and II.	Producing Agency code is not a valid S-62 value.	Amend AGEN subfield to a valid S-62 value.	2.2.1	C

S-58 check #1518b: This check is correct and should be retained.

1518b	If the first 2 characters of the data set file name do not correspond to the value of the AGEN subfield of the DSID field.	Data set file name does not begin with the agency code corresponding to that set in the AGEN subfield of the DSID field.	Amend the first 2 characters of the data set file name.	2.2.1		C

Conclusions

Current ENC validation checks reporting 'Critical errors' when FOID AGEN and DSID AGEN do not match are incorrect. At the same time, S-57 section 4.3.2 may require further clarification and S-58 may need amendments.

Recommendations

- Asses the benefits of releasing a new Maintenance Document (MD9) to clarify the content of section 4.3.2 of the S-57 Main Document.
- Liaise with the main manufacturers of ENC Validation tools to request the removal of any 'Critical error' related to mismatches between FOID AGEN and DSID AGEN. The existing validation checks may be downgraded from 'Critical' to 'Warning' with the only intention of detecting AGEN mismatches and allowing producers to check they were not created in error.
- Update the new S-58 test dataset to prevent the report of 'Critical errors' when FOID AGEN and DSID AGEN do not match.
- Asses the possibility of removing check 1518a from S-58. It seems to look for the same issue than check # 7 does.
- Liaise with the S101PT in order to avoid similar misinterpretations being transferred to the S-101 Product Specification and/or DCEG.

Justification and Impacts

IHO's intention is that Critical Errors will become mandatory to fix before ENCs are cleared for release. This practice should start once software conforming to S-58 6.1.0 is available and in use by ENC producers.

Unless ENC validation tools and the new S-58 test dataset are updated to not report mismatches between FOID AGEN and DSID AGEN as 'Critical', the release or update of several currently published ENCs may end up being delayed or even stopped.

Action Required of ENCWG

The ENCWG is invited to discuss the topic and agree on the recommendations.