

Paper for Consideration by S100TSM9

Official vs Unofficial data and producer codes

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Executive Summary:	Drafting of S-164 has highlighted the issue of how S-100 ECDIS determine if data is “official” or not, what “official” means in an ECDIS context and the impact on how producer codes are defined and used.
Related Documents:	S100WG7-4.3
Related Projects:	

Introduction / Background

Under the S-57 regime ECDIS is permitted to import data in one or more of the following forms:

1. Unencrypted ENC (standalone ENCs and exchange sets)
2. Encrypted ENC using S-63 (exchange sets)
3. SENC format

S-57 ECDIS also have a requirement to differentiate (and delimit) between “official” and “unofficial” data on the display. Under SOLAS “official” data is that which is issued by a Hydrographic office or “other authorised government institution”. On an S-57 ECDIS the producer code is used to determine whether data is official or not. IHO S-62 contains a list of producer codes covering official and unofficial ones.

As ECDIS developed it became clear it was impossible for operational systems to receive regular S-62 updates leaving systems unable to determine if an unrecognised producer code should be defined as official or unofficial. A convention of codes beginning with numeric values being unofficial was therefore used by OEMs and codes assigned by the IHO to various bodies in accordance as appropriate. This situation has continued to the present day with OEMs not referring to S-62 to distinguish between the different types.

IHO also issues S-64 data and Chart 1 cells which are used extensively by manufacturers for ECDIS development and testing.

As S-63 is an optional standard current ECDIS also decides whether or not to import data based on two data integrity methods

1. CRC value in the CATALOG.031 file. If the CRC32 value is incorrect the cell is not loaded under any circumstances
2. If the data is encrypted and digitally signed and the signature is invalid then the data is not loaded under any circumstances
3. If the data is encrypted and digitally signed but the signature can not be traced to the IHO (e.g. if the data is self-signed or authenticated by a body other than the IHO) then the user is given an option to load it with appropriate warnings issued.

S-100 requires solutions to both of these loading/import protocols. Producer codes under S-100 are in the process of being defined but no defined official vs unofficial moniker is yet adopted and the import protocols when faced with non-SA signed data are at the draft stage in S-98 Annex C. S-100 has no CRC values but all datasets require digital signatures and certificates authenticated by the SA (IHO) to be valid under S-100 Part 17.

Analysis/Discussion

The first question to answer is whether there is a continued requirement for “unofficial” data on ECDIS, from a SOLAS/IMO perspective. Unofficial data is, from a SOLAS perspective, anything which is NOT issued by a hydrographic office (or other institution) for the purposes of navigation and an ECDIS using unofficial data does not meet carriage requirement. Large scale port data, inland ENC’s etc could be seen as unofficial data.

If there is such a requirement and the ECDIS must determine whether data is official or unofficial then there are options for how this should be done.

Option 1

- Use the producer code, as is used for S-57.
- The producer code convention should be firmly defined in S-98 Annex C and then used to determine S-164 datasets

Option 2

- IHO uses a role code in the data server certificate certifying producer codes as “unofficial”, “official” etc.
- The role is used to determine data status and portrayal of data on screen

It is worth noting that if the decision is taken to allow import of non-authenticated (but valid) data to the ECDIS (with appropriate warnings) then there is no need for IHO to certify the identity of non-official producers as it serves little purpose on an operational ECDIS. From this point of view IHO has no interest in certifying (or even identifying) unofficial producers as the risk to the ECDIS would be the same.

This is mirrored from the S-57 perspective, anyone can currently create a dataset purporting to be from any data producer and an ECDIS has no way, currently, of determining if it is genuine or not. Now that ALL datasets require a mandatory digital signature authorised by the IHO this is a far more robust way of establishing the official credentials of any data.

The situation also needs to be considered in the context of “overlays” on top of charts, e.g. unofficial overlays on top of official charts. Should these be allowed?

Conclusions

- A matter of policy is required in how S-100 is rolled out to end users, data producers and OEMs
- The current methodology of data producer codes is merely a convention and has little inherent security
- There is an option to use IHO’s certification of identity to provide seamless import to an S-100 ECDIS with unauthenticated import flagged to users as potentially unsuitable for official (primary) navigation.
- The use case for “unofficial” data on the ECDIS should really be examined and concluded prior to a system being put in place.
- How this issue is resolved should be defined completely in S-98 for the benefit of OEMs and reflected in S-164.

Action Required of S-100WG TSM

The S-100WG is invited to:

Note the paper and discuss proposed changes