S-124 Validation Checks

Submitted by S-124NW PT Chair

SUMMARY

Executive Summary: Report provides an update on the S-124 and S-158 Validation checks

Action to be taken:

1. The WWNWS-Sc should endorse the way of managing S-124 validation checks;
2. Submit the S-124 validation checks to the S-100WG;
3. Confirm the validation check working group and identify the lead.

Related documents: S-100, S-124, S-158, S-57, S-58, HSSC16_2024_05.1A_Rev4_WWNWS15 report

Background

At the 8th Test Strategy Meeting of S-100 Working Group the topic of validation checks was discussed in depth. This discussion included the relationship of S-158, which up till then had focused on S-100 level validation checks, and the validation checks specific to the individual product specification. The discussion recalled the lessons learned from the S-57 standard, which originally included the ENC product specification and an annex of validation checks. However, with the freezing of the 3.1 edition of S-57, it was no longer possible to update the validation checks and therefore the content of validation checks annex was moved into a new standard called S-58. This new standard was then updated based on need and experience with the production and use of s-57 ENC. The TSM8 meeting noted that there is a similar risk to the phase 1 S-100 based product specifications in that any change to any part of the product specification documents necessitates a version change, which will necessitate changing the production environments and their outputs to match the versioning of the latest edition.

TSM8 therefore concluded that it is better to move all validation checks into S-158 and maintain that separately in a manner that permits validation checks to be modified and updated independently of the product specification. This will be managed by each product specification that is included in S-158 being given an independent part of the overall standard. Each of these parts will be managed independently of each other, meaning that a change to one product specification does not necessitate versioning changes in another. It will be up to owner of the specific product specification to initiate changes to the validation checks once these have been included in S-158. Overall management of S-158 will reside with the S-100 Working Group, specifically via their data validation sub group.

S-158 Structure proposed by S-100WG is to split into individual parts that are managed as separate specifications. And thus giving a structure like this;

- S-158 Introduction and Structure
- S-158: 100 ed 1.0
- S-158: 98 ed 1.0.
- S-158: 101 ed 1.0
- S-158: 102 ed 1.0
- ….
- S-158: 124 ed 1.0
- Etc

Each part will be managed by their respective working groups/PTs and will have its own HSSC/IHO MS endorsement/approval process

Impacts

During the S-124 discussions which took place at WWNWS15 it was noted that a working group is needed to manage the validation checks for S-124 and as a consequence action 25 was noted as '*Identify a lead for the S-124 validation checks'*.

The methodology developed by the S-100WG in managing validation should not make the overall validation check management more clear and easier to follow.

The validation checks in Edition 1.0.0 of S-124 was removed in Edition 1.5.0 in anticipation of the development of S-158, and are included to this paper as an annex.

Recommendation

1. The WWNWS-Sc should endorse the way of managing S-124 validation checks;
2. Submit the S-124 validation checks to the S-100WG;
3. Confirm the validation check working group and identify the lead.

Annex - Validation Checks

1. References

IHO S-58 ENC VALIDATION CHECKS Edition 6.1.0, September 2018
IHO S-97 Part C IHO data quality checklist [Draft 0.2, August 2018]

2. Abbreviation

PS – Product Specification
DCEG – Data Capture and Encoding Guide

3. Production validation checks for S-124 Navigational Warnings

The following checks are intended for production systems designed to produce S-124 Navigational Warning datasets. The checks can be administered at any time during the production phase. All checks should be considered as warnings, even though more severe classifications are available, due to the status of the development and lack of experience with system use of S-124 datasets, it is considered premature to classify any checks as error or critical error at this time. All operators and spatial expressions are defined in Annex A.

3.1 Check classification

C	Critical Error	An error which would make an MTM dataset unusable in ECDIS through not loading or causing an ECDIS to crash or presenting data which is unsafe for navigation.
E	Error	An error which may degrade the quality of the MTM dataset through appearance or usability but which will not pose a significant danger when used to support navigation.
W	Warning	An error which may be duplication or an inconsistency which will not noticeably degrade the usability of an MTM dataset in ECDIS.

3.2 Checks relating to S-124 Product Specification

No	Check description	Check message	Check solution	Conformity to
100	For each feature object where its geometry is not COVERED_BY the bounding box.	Objects fall outside the coverage object.	Ensure objects are not outside of the limits of the cell.	GML schema
101	If the dataset file size is greater than 50KB.	The dataset is larger than 50KB in size.	Ensure that the dataset is not larger than 50KB.	PS **Error! Reference source not found.**

102	For each feature record where the name is not unique WITHIN the dataset.	Duplicate gml:id exist within the dataset.	Ensure that no duplicate gml:id exist.	PS **Error! Reference source not found.**
103	If any mandatory attributes are not present.	Mandatory attributes are not encoded.	Populate mandatory attributes with a value.	PS **Error! Reference source not found.**
105	For each feature object with an attribute of type Float or Integer where the value contains zeroes before the first numerical digit or after the last numerical digit.	Values have been padded with non-significant zeroes. E.g. : For a flip fearing of 180 degrees, the value of flipBearing must be 180 and not 0180.00.	Remove non-significant zeroes.	PS **Error! Reference source not found.** & **Error! Reference source not found.**
106	For each association between features instances, features instances and information instances, and between information instances that is not defined in the feature catalogue.	Wrong association used.	Use correct association type.	Logical consistency
107	For each role name on associations that is not defined in the feature catalogue.	Wrong role used.	Use correct role name.	Logical consistency
108	For each association that is not defined in the feature catalogue.	Unknown association is used.	Use association that is defined in the feature catalogue.	Logical consistency
109	For each role name that is not defined in the feature catalogue.	Unknown role name is used.	Use role name that is defined in the feature catalogue.	Logical consistency
110	For each association ensure associated classes are only those permitted by the feature catalogue.	Class is associated in an illegal association.	Ensure correct association is used between classes.	Logical consistency
111	For each role name ensure it is only used with permitted associations.	Role name is used on an illegal association.	Ensure correct role names are used on the association.	Logical consistency
112	Ensure dataset conformance to the GML schema.	Dataset does not conform to the GML schema.	Ensure conformance to the GML schema.	PS **Error! Reference source not found.**

113	Ensure all text fields are encoded using UTF-8.	Illegal character set used.	Change character encoding to UTF-8.	PS **Error! Reference source not found.**
114	For each feature instance where more than one featureName is present, and the name subattribute of two or more featureName instances are equal.	Values name sub attribute are identical.	Ensure that name subattributes are populated with the correct values.	Logical consistency
115	For each featureName subattribute with language not equal to eng, and where featureName subattributes with language equal to eng is not present.	Name is encoded in national language only.	Populate text attribute with English text.	Logical consistency
116	For each warning information subattribute with language not equal to eng, and where information subattribute with language equal to eng is not present.	Text is encoded in national language only	Populate name attribute with English text.	Logical consistency
117	If the horizontal CRS in the dataset is Not equal to EPSG:4326 (WGS 84).	Horizontal CRS is not EPSG 4326	Set the horizontal CRS EPSG 4326 and verify that all spatial primitives are in EPSG:4326	PS **Error! Reference source not found.**
118	If the file names in an exchange set are not in accordance with the Product Specification.	File names are not in accordance with the Product Specification.	Amend file names.	PS **Error! Reference source not found.**
119	For each feature instance that does not OVERLAP OR is WITHIN the bounding box.	Object outside dataset bounding box.	Remove object or amend coverage.	PS **Error! Reference source not found.**
120	For each feature instance which does not have a valid feature class label/code as defined by the feature catalogue.	Object has invalid feature class code.	Amend object's feature class code.	PS **Error! Reference source not found.**
121	For each attribute which does not have a valid attribute label/code as defined by the feature catalogue.	Attribute has invalid attribute label/code.	Amend attribute label/code.	Logical consistency

122	For each feature object which contains attributes outside the list of permissible attributes for the feature class (as defined in the feature catalogue).	Attribute not permitted on feature class.	Remove attribute.	Logical consistency
123	Fore each References with noMessageOnHand equal true, and at least one messageSeriesIdentifier attribute is present	messageSeriesIdentifier can not be present when noMessageOnHand equal true	Change noMessageOnHand to false	PS 4.3
124	For each References with noMessageOnHand equal false and no messageSeriesIdentifier attribute is present	Missing messageSeriesIdentifier attribute	Add messageSeriesIdentifier	PS 4.3
125	For each attribute instance where the total number of instances exceed the permitted number of instances	Too many instances of attribute.	Ensure correct attribute encoding.	Logical consistency
126	For each feature instance where fixedDateRange subattributes dateEnd and dateStart are notNull AND their values are identical.	Object has identical values of periodicDateRange subattributes dateEnd and dateStart.	Ensure values of periodicDateRange subattributes dateEnd and dateStart are logical.	Logical consistency
127	For each feature instance where fixedDateRange subattribute dateStart is notNull AND dateEnd is Null OR not Present.	Object has dateStart without a value of dateEnd.	Populate dateEnd or remove dateStart.	Logical consistency
128	For each feature instance where fixedDateRange subattribute is notNull AND dateStart is Null OR not Present.	Object has dateEnd without a value of dateStart.	Populate dateStart or remove dateEnd.	Logical consistency
129	For each linear geometry which contains vertices at a density Greater than 0.3mm at 1:10000.	Vertex density exceeds the allowable tolerance.	Generalise edge(s).	PS 8.8

130	For each value in navwarnTypeDetails codelist that is not paired with the recommended value in the navwarnTypeGeneral codelist.	The combination of navwarnTypeDetails with navwarnTypeGeneral does not conform with the recommendation.	Review the combinations to ensure correctness.	Logical consistency
131	For each coordinate touple that exceed 7 decimals.	Coordinates contains un-necessary accuracy leading to larger data sizes.	Restrict the coordinate values to 7 decimals or less.	PS **Error! Reference source not found.**
132	For each instance of NAVWARNPreamble that does not have a NAVWARNReferences or NAVWARNPreambleContent association	NAVWARNPreamble must be associated with at least one References or NAVWARNPart	Define relationship	PS 4.3
133	For each NAVWARNPreamble with navwarnTypeGeneral containing other	navwarnTypeGeneral uses a non standard value	Ensure that the non standard value is necessary and accurate.	PS 4.5
134	For each NAVWARNPart with warningInformation containing at least one instance of navwarnTypeDetails and navwarnTypeDetails contain other	navwarnTypeDetails uses a non standard value	Ensure that the non standard value is necessary and accurate.	PS 4.5