

S-101 Validation Checks Overview

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Approach

The S-101PT formed a sub group to develop S-101 Validation Checks after S-100WG5 (May 2020). The group has created checks in two categories;

- S-100 checks - currently 164 checks
- S-101 specific checks - currently 276 checks
- This approach is intended to support reuse of checks and consistency across product specifications, it also utilises the Feature Catalogue to simplify software implementation and updating

Example – S-100 level checks

4	S100_4a_007	4a	MissingCatalogFile	If the CATALOG.XML file is not present.
4	S100_4a_008	4a	CatalogDatasetInconsistent	If any of the same values listed in the CATALOG.XML and present in the ISO 8211 are not identical.
5	S100_5_001	5-A	ProhibitedObject	For each object which is present in the dataset but not present in the S-101 Feature Catalogue.
5	S100_5_002	5-A	DuplicateObject	For each object where another object has identical attribute values and identical geometry (if applicable).
5	S100_5_003	5-A	ProhibitedGeometry	For each object which is present in the dataset which references a geometry which is not permitted in the S-XXX Feature Catalogue. (includes no geometry)
5	S100_5_004	5-A	ProhibitedAttribute	For each attribute present in the dataset which is not present in the S-101 FC.

These checks have been developed by identifying S-58 checks which could apply to any S-100 products specification they have been organised based on the sections of S-100 and given both severity and a Data Quality category.

1012	C	Metadata Consistency
531	C	Metadata Consistency
504, 545	C	Domain Consistency
67a	E	Logical Consistency
12, 20a, 1797	C	Conceptual Consistency
511, 546, 547, 1567+various	C	Conceptual Consistency

Measure in S-97 Annex C ISO 19157

Data Quality Measure	Definition	DQ measure / description	Evaluation scope	Applicable to spatial representation types
Completeness / Commission	Excess data present in a dataset, as described by the scope	numberOfExcessItems / This data quality measure indicates the number of items in the dataset, that should not have been present in the dataset	dataset/dataset series	All S-100 based PS
Completeness / Commission	Excess data present in a dataset, as described by the scope.	numberOfDuplicateFeatureInstances / This data quality measure indicates the total number of exact duplications of feature instances within the data.	dataset/dataset series	All S-100 based PS
Completeness / Omission	Data absent from the dataset, as described by the scope.	numberOfMissingItems / This data quality measure is an indicator that shows that a specific item is missing in the data.	dataset/dataset series/spatial object type	All S-100 based PS

Example – S-101 level checks

B	S-101_B_001	S-101 Annex B 6.1.14	Invalid Sounding Object	For each SOUNDG feature object which does not reference a C3DI field with X, Y and Z values.
4	S-101_4_002	S-101 PS 4.3.2.1.1; Annex B 5.1.28; Annex B 6.1.27	Skin of the Earth Coverage Incomplete/Overlap	For each Ring Association Field (RIAS) which is referenced by Skin of the Earth geo features AND is not referenced by a meta feature Data Coverage which does not appear twice with different ORNT (forward and reverse) values.
A	S-101_A_001	S-101 Annex A 6.2; 7.2; 7.3; 7.4; 7.5; 8.12	Object Missing "in the water" Attribute	For each Building, Crane, Fortified structure, Landmark, Silo/Tank or Wind turbine feature without the boolean attribute 'in the water' set to True which is COVERED_BY a Depth area or a Dredged area feature object.
A	S-101_A_002	S-101 Annex A 20.13.1	Daymark not covered by a suitable supporting object	For each Daymark feature object which does not have an equipment role in a structure/equipment association AND is not COVERED_BY a Bridge, Coastline, Dam, Hulke, Floating Dock, Land Area, Offshore Platform, Pile, Pontoon, Pylon/Bridge Support, Shoreline Construction or Underwater Rock feature object OR a Mooring/Warping Facility feature with category of mooring/warping facility equal to 1 (dolphin) OR 2 (deviation dolphin) OR 5 (post or pile).

These checks have been developed by adapting S-58 checks to S-101, references to S-58 have been retained. These checks are considered S-101 specific but could be reused for products like S-401.

Replaces S-58 Check(s)	DQ Theme	S-58 Sever
19	Logical Consistency	W
24	Logical Consistency	C
42	Logical Consistency	C
54a	Logical Consistency	C
54b	Logical Consistency	C

Current Status

- Currently only one available validation tool supports S-101 SevenCs Analyzer
- It is hoped that support will increase following publication of edition 1.1.0 of S-101
- Feedback is needed to further develop the checks but this needs them to be implemented and used
- Potential for S-100 level checks to be included in S-97 Annex C?