Paper for Consideration by S-101PT11

Support file management

Submitted by:	PRIMAR
Executive Summary:	This paper includes considerations regarding the support file management.
Related Documents:	S-101 v.1.1.0 PS, S-101 DCEG v.1.1.0
Related Projects:	

Introduction / Background

We think there is a gap between available support file types and how support files are described in the S-101 Product Specification. We distinguish two types for the support files listed in this PS, but only one of them is described in more detail in the support file management section of this specification and in the S-101 DCEG.

1) A support file as a part of an S-101 ENC's compilation (S-57 support file equivalent) - today known as .TXT or .TIF files. This type of the support file is effectively an extended attribute for the ENCs feature and must be read by ECDIS user for navigational purposes. Basically "directly linked" support file to the ENC/ENCs. In S-101 PS mentioned is "supportFile" support file. This proposal concentrates on this type of support file management clarification.

2) A support file as introduced with S-100 and could be used by any S-100 PS, including S-101 PS. Added are files ending with .HTM and .XML. In S-101 PS listed are "ISOMetadata", "Language pack", "GML schema" and "Other" support files. The current S-101 PS does not describe well or at all the management of these types of support files - how these would be linked to the S-101 dataset, how these should be used in the end user system, or when would be the use cases for these to be produced and by whom.

Note. It is noted that the use of the metadata in form of ISOMetadata file was discussed during the S-100TSM9 meeting and agreed that ISOmetadata should be not considered in the navigational products ([Decision 9/17] S-100TSM).

We raise a concern, that the product manageability in the delivery chain is incomplete as some of the product management necessary options specific to ENC delivery mechanism become ambiguous or illogical. Also we see a risk of a support file management failure if the support files would be packaged alone in the Exchange set without the base or update dataset file that it refers to Please see further in the Analysis section for a potential exceptions.

Linked to the concern above we note that there has been very little testing regarding support files and their discovery metadata attributes in the S100_SupportFileDiscoveryMetadata, specifically the *supportedResource* and the *resourcePurpose.*

S100_DatasetDiscoveryMetadata, as defined by current S-101 PS, does not have an attribute that would indicate that this dataset "includes" or "must be used with" one or more support files. Regarding a common understanding the support file is there because some navigationally significant information that must be in the ENC (as a base navigational layer in ECDIS) does not fit in Information attributes limited fields. So the Information is saved in a textual or picture file and the file name of that extended information is added in the Information attribute in the ENC as a link.

Analysis/Discussion

1. Because the two different types of support files exist in S-101 we suggest to mandate the support file's attribute resourcePurpose. This will help to identify the type of support file and will facilitate better distribution and management of support files in the product production systems as well as in the end user systems.

2. All support files listed in the S-101 PS table in section 12.1.3.4. S100_ResourcePurpose, and especially "supportFile", misses the definition and hence is interpreted differently by different S-101 actors. We suggest clarifying that in the Description and Remarks columns and consider a separate subsection under the section 11.4. Support files for each of the named ResourcePurpose. The suggestion for "supportFile" then would be to define it as it is used with S-57 today - as a support file which is an extension of the ENC attribute encoding.

3. In the DCEG v.1.1.0 at section 2.4.12.2 Reference to pictorial files, the statement of population consideration of the pictorial representation attribute importance in terms of safety of navigation must also be added to the textual description at the 2.4.12.1 Reference to textual files. Also should be considered adding some wording in the PS Main document where the support files are mentioned at section 11.4 Support files. This would limit and provide the reason for the (directly linked) Support file application in the ENC, bearing in mind the readability and processability of that information during Route Monitoring mode on ECDIS on the bridge of a ship.

4. Situations must be avoided, where the support file could be transferred alone, as a product, using the Exchange set. That should not be allowed also in the use cases where the (directly linked) support file is issued prior to, or after the ENC or ENCs update, where the support file is or will be referenced. There should be clear description in the S-101 PS section 11.4 Support files or section 11.2 Exchange Set, not allowing to transfer data in such a way using the Exchange set. The only situation it is allowable is when the (directly linked) support file is issued as a New Edition and the support file does not change any reference to ENCs - neither added to new ENCs or removed from ENCs.

5. Support files use case scenarios were considered and investigated. In this process it cleared out that the backward link from the support files metadata to the dataset (support file discovery metadata supportedResource) creates issues - when the support file must be deleted from one dataset it is encoded in but not from other datasets. In this case, the deleted support file also must be included within the same exchange set with updated it's discovery metadata. It was also not clear if in this situation the support file's Edition number must be increased to trigger it's reading (both support file itself and its updated metadata) in the end user systems. This is not logical data production, management and distribution situation and should be avoided. For this reason we suggest to make it conditional mandatory not to be encoded if the ResourcePurpose is "supportFile".

    a. If left unchanged and as it is defined now, the complicated encoding and situation may still arise, as it is optional. We suggest to consider to remove the attribute completely and search for a discussion, if this could negatively impact the other type of the support files (indirectly linked) for this Product Specification. Is there a need for S-101 ENC ever to have a S-101 dataset independent support file? Welcoming the Group's views on this.

6. As the standard transfer of the ENC is in encrypted form within the Exchange set, it is not possible to discover from the S-101 ENC DatasetDiscoveryMetadata that the ENC is compiled and actually consists of a collection of files in the cases where ENC has one or more (directly linked) support files to some features in the ENC. Reading current statement in S-100 v.5.1.0 about data discovery metadata (though in Part 8 for HDF5) suggests that if the dataset has been partly encoded in a separate support file and that file must be used in conjunction with this dataset, then this must also be reflected somehow in the ENC products

datasetDiscovery Metadata. This becomes especially important readable information as the ENCs during their transfer as published products are encrypted. Similar example we could bring up is the Coverage feature in the ENC and as a discoverable metadata is a bounding box attribute in the discovery metadata. The support file, if existing in the ENC, should be also discoverable through datasets discovery metadata for unambiguous and quality product transfer between the producer and the end user. We see two possible options:

a. to use the existing dataset discovery metadata attribute Comment field and standardize by recommending the coding in it referencing the support files that are included in the ENC and must be accompanying the ENC in the Exchange set. For discussion, but, because there is a potential to become that way non machine readable very quickly, we do not recommend this option as permanent),

b. or to add a new S100_DatasetDiscoveryMetadata attribute (or extending? the attributes for S-101 PS, as described in the S-100 v.5.1 Appendix 4a–D), and call the new attribute alike "supportFileReference" (URI, listing support files compiled into or to be used in conjunction with ENC). In our understanding this would work for both earlier distinguished types of support files - the old and the new way support files. Also this way avoids the non logical earlier recognized support file discovery metadata updating necessity in the case of the support file removal from the ENC or its feature.

In the case if the above suggestions are not considered and appropriately implemented, then we see a potential misuse of the support files encoding, distribution and application. The situation now can easily occur that the producer issues support files way ahead of the actual datasets, or possibly forgets to specifically instruct ECDIS to delete non relevant support files or instructs to delete the support files still needed for other ENCs, and ECDIS and distributors could be in a situation forced to manage and store many irrelevant if not all possible support files in the service for the ENCs it does not have.

But if the proposal is implemented we trust that the ambiguity of support files linkage to the ENCs would be eliminated and would be also avoided the illogical encoding and delivery scenarios.

Conclusions

1. Propose to mandate the population of support file's discovery metadata attribute resourcePurpose.

2. Propose to clarify the "supportFile" and other listed named support file's definitions in the Remarks and Description fields of table in section 12.1.3.4 S100_ResourcePurpose and at section 11.4 Support files of the Main document by adding subsections for each named support file.

3. Harmonize the encoding requirements/considerations between the pictorial and textual (old way) support files in the DCEG and PS Main document.

4. Propose to update the PS Main document text to reflect that the support file in the Exchange set must be always accompanied with the dataset it refers to, with one exception.

5. Propose to make conditional non population of a discovery metadata attribute supportedResource, and discuss its complete removal option from the support files discovery metadata.

6. Search for the agreement from the Group to propose to S-100WG to add a new dataset discovery metadata attribute for use in the S-101 PS.

7. Propose to remove the ISO metadata support file option from the S-101 PS as per the S-100TSM9 recommendation.

Action Required of S-101PT10

The S-101PT11 is invited to:

Discuss the report and evaluate to proceed with the proposed changes.