

Paper for Consideration by TSMAD and DIPWG

S-101 Support Files

Submitted by:	S-101 Work Item Leader
Executive Summary:	This paper is to review the Phase 2 support file functions
Related Documents:	S-101 Product Specification
Related Projects:	N/A

Introduction / Background

1. As part of the development process for S-101, it was determined that the S-101 support file and management set will be reviewed in phase two of the project. This paper examines the existing content for support files and seeks TSMAD and DIPWG discussion on the existing content and discussion regarding how support files must be managed.

Analysis/Discussion

2. Currently the information regarding Support files in S-101 was last discussed at TSAMD20/DIPWG2. Progress was made in specifying the types of support files that can be used and the naming convention.
3. At TSMAD18/DIPWG1 the UKHO submitted a paper regarding support files. Support files were also discussed at TSMAD 20/DIPWG 2 and the resulting action was for the S-101 Work Item Leader to resubmit this paper for the next joint meeting. This will form the starting point for discussion on support file management, specifically clause 6.2 and clause 7. This paper is located as an annex to this discussion paper.
4. In addition, TSMAD and DIPWG need to review the metadata fields for support file and propose additional fields as a result of discussions from the UKHO paper on support file management.
5. The following are the current metadata fields for support files:

Name	Cardinality	Value	Type	Remarks
S-101	-		-	-
SupportFileDiscoveryMetadata				
fileName	1		CharacterString	
filePath	1		CharacterString	
Purpose	1	{1} to {2}	S-100_SupportFilePurpose	1. Insert - Signifies a new file 2. Deletion - Signifies a deletion of a file of that name
editionNumber	1		CharacterString	When a data set is initially created, the edition number 1 is assigned to it. The edition number is increased by 1 at each new edition. Edition number remains the same for a re-issue.
issueDate	1		Date	Date on which the data was made available by the data producer.
productSpecification	1		S-100_ProductSpecification	Version of S-101
dataType	1	TXT XML HTM TIFF	S-100_SupportFileFormat	Text files Text files Text files Picture files
Comment	0..1		CharacterString	Any additional Information NATIONAL LANGUAGE enabled
Crc	1		CharacterString	

Recommendations

6. TSMAD and DIPWG should discuss potential options on how support files should be managed. At the last joint meeting Caris proposed the following solution:

Part of the problem is that these support files just hang around, and makes sense that these support files be treated as an attribute as a single feature, and if multiple objects need to share a support file then the attribute that would share that feature would be a information type and that it should be imbedded in the data

7. It is generally agreed that if the producing agency deletes the support file from the ENC then it should be deleted from the ECDIS, however, it is complicated when that same support file is referenced to a different dataset.
8. Perhaps the solution would be to not use the same support file for multiple datasets even though they may contain the same information.

Action Required of TSMAD and DIPWG

The TSMAD and DIPWG is invited to:

- a. discuss support file management in S-101 based on the ideas from the UKHO

Joint TSMAD18 & DIPWG1 MEETING4th to 8th May 2009 (Ottawa, Canada)**IHO S-101 ENC Product Specification
Formatting and Management of ENC Support Files****1 Introduction**

The purpose of this paper is to propose a potential solution for the effective management of ENC support files. It seeks to provide Data Servers (ENC Service Providers) with the necessary tools to encode meta data relevant to these files. This in turn will give the OEMs the means to manage these more effectively and efficiently in the ECDIS. This paper aims to provide a "straw man proposal" to provoke discussion.

For clarification purposes the term "Support File" in S-101 is used in the context of "External" or "Ancillary" files as described in the S-57 Product Specification and other publications.

2 Background

The current S-57 Product Specification states that Text and picture files may also be included in the ENC exchange set. These files may be included in an exchange set by a data producer to provide additional information such as that normally contained in sailing directions or coastal pilots. It further defines the file naming conventions and formats that can be included in an S-57 Exchange Set.

Data Servers were unable to provide any additional information pertaining to these files and there was no guidance given as to how these should be managed in an ECDIS. Manufacturers were very much left to decide for themselves how this was done. Experience has shown that these methods are wide and varied and range from the use of complex algorithms to just copying all external files to disc.

As a consequence of this, and with the advent of integrated encrypted ENC services, has resulted in the same files being stored multiple times in an exchange set (and sometimes the ECDIS). The original specifications were also open to a degree of misinterpretation.

3 Definition

A support file offers supplementary information that can be included in an ENC exchange set and referenced by single or multiple data files. Text, picture, audio and video files are all permissible in an ENC exchange set. The content of each support file and any subsequent version(s) is unique to any particular ENC cell or cells.

4 Support File Meta Data

The current product specification does not provide a mechanism for managing the status of a support file. For instance there is no method that can instruct the ECDIS to remove redundant/cancelled files. Also there is no method that allows Data Servers to manage different versions of the same file. The S-101 ENC Product Specification now provides an opportunity to address this issue using the "Support File Discovery Metadata" file.

Assumption: all discovery meta data relating to support files will be contained in the one file. If this is true then each producer nation would maintain this file, up to date, for their full collection of support files.

5 Naming Convention

Support files may or may not be of fixed length formatted as follows:

File Name	Type	Value	Remarks
Producer Code	CharacterString	[2]	Two character national producer code as defined in ISO 3166 or other registered company/organisation user codes
Support File Name	CharacterString	[8]	Any upper case alpha characters A to Z and digits 0 to 9.
Delimiter	CharacterString	[1]	A single underscore
Support File Version	CharacterString	[3]	1 - 999
File Extension	CharacterString	[3]	As defined in the SupportFileDiscoveryMetadata "data Type"

Example of formatting:

PPNNNNNNNN_VVV.EEE

Where P is the Producer Code [fixed length]

N is the File Name [may or may not be of fixed length]

_ is the version delimiter

V is the file version (1 – 999) [fixed length]

. is the extension delimiter

E is the File Extension

6 The "SupportFileDiscoveryMetadata" File (Name to be defined)

The "SupportFileDiscoveryMetadata" file will be issued with each Base Exchange set and will only contain records for support files contained within that exchange set. The Update Exchange set however will contain records for all support files where it applies to multiple Base Exchange sets. This file will be recorded in the catalogue file (Catalogue.xsd) indicating the destination path where the file can be found.

The "metadataDateStamp" (see Annex A) contained in the "Catalogue.xsd" file will allow the ECDIS to manage the import and reading of this file. ECDIS must not read a file that has an earlier date than the already installed file.

In instances where new base files are being installed, and in the absence of an update, systems should concatenate these files to build a complete set of records¹.

6.1 The "SupportFileDiscoveryMetadata" Record

Each "SupportFileDiscoveryMetadata" record will be formatted as defined below:

Name	Crdblty	Type	Value	Remarks
S-101 SupportFileDiscoveryMetadata	-	-	-	-
fileName	1	CharacterString	variable	As defined at 5 above
data Type	1	S-101_SupportFileType	TXT, XML, JPG PNG, MP3, MP4	Depends on formats defined in S-100
filePath	1	CharacterString	variable	Identifies the destination folder where the file is stored
issueDate	1	Date	[8]	The date the file was created, modified or cancelled - YYYYMMDD
expireDate*	1	Date	[8]	The date at which a file is known to expire. YYYYMMDD
fileStatus	1	S-101_SupportFileStatus	1 = New	Identifies the file status ²

¹ In the case of encrypted ENC's this may be a subset of records based on the user's ENC permits if this is the preferred method.

			2 = Modified 3 = Cancelled	
fileType*	1		1 = T Notice 2 = P Notice 3 = Chart Note 4 = Other?	Could be used by ECDIS to bring certain files to user's attention.
encLink	1	CharacterString	Filename (no extension)	Comma separated string of ENC's accessing the support file.
crc	1	CharacterString	[8] [4 bytes]	e.g. A1B2C3D4
Comment*	0..1	CharacterString	[300]	Maximum 300 characters

* Non mandatory fields

Example of "SupportFileDiscoveryMetadata" Record:

(Note: XML not confirmed as format)

```

<fileName>GBFILENAME_003</fileName>
<dataType>TXT</dataType>
<filePath>GB\SupportFiles\TXT\GBFILENAME_003.TXT</filePath>
<issueDate>20090401</issueDate>
<expireDate></expireDate>
<fileStatus>1</fileStatus>
<fileType>2</fileType>
<encLink>GB100001,GB100002</encLink>
<crc>4B793A55</crc>
<comment>BA Weekly NtoM 17/09, 1002(P)/09</comment>

```

6.2 File Management

When a support file is created or a subsequent version issued it will carry an issue date and a CRC value calculated on the content. These values will held in the relevant fields within the "SupportFileDiscoveryMetadata" record and must not change while the file is still current³.

The type of a support file is indicated in the "status" field, i.e. new file, new version of an existing file or cancelled. Support files carrying the "Cancelled" flag can be removed from the ECDIS. Data Servers must ensure that the support file record is retained in the "SupportFileDiscoveryMetadata" file for a sufficient period⁴. This is to ensure that the cancellation message is available to an ECDIS that is not subject weekly updating, e.g. vessels at sea, in refit, etc.

The "fileType" field has been included to flag up support files of particular interest, e.g. support files that directly refer to T&P (Temporary and Preliminary) NMs. This field is included as this may be a method that can be utilised to highlight T&P notice information to the Mariner via the ECDIS. A link is provided, "encLink", so ENC's in the ECDIS viewer can highlight the fact there is T or P information available.

Some data producers already attach a textual note (TXTDSC) or a pictorial representation (PICREP) to encoded T&P information. This usually takes the form of a sanitised version of the paper T&P weekly notice tailored for ENC's.

NOTE: T&P information encoded as an ER could be similarly flagged at the object level, Theme Feature Types, etc. If accepted this will have to be addressed in S-101 Product Specification in the appropriate section.

² It has been suggested that there should be a "Current" flag as well. My concern is that not all ECDIS are updated on a weekly basis and this may cause the ECDIS problems managing these and new cells.

³ That is the file still references an ENC an exchange set or data server's service.

⁴ What is a sufficient period?

If the method identified above is accepted then a further, non mandatory, field could be included that encodes the expiry date of a T&P related support file. When the expiry date is reached the ECDIS could automatically remove the file from the system.

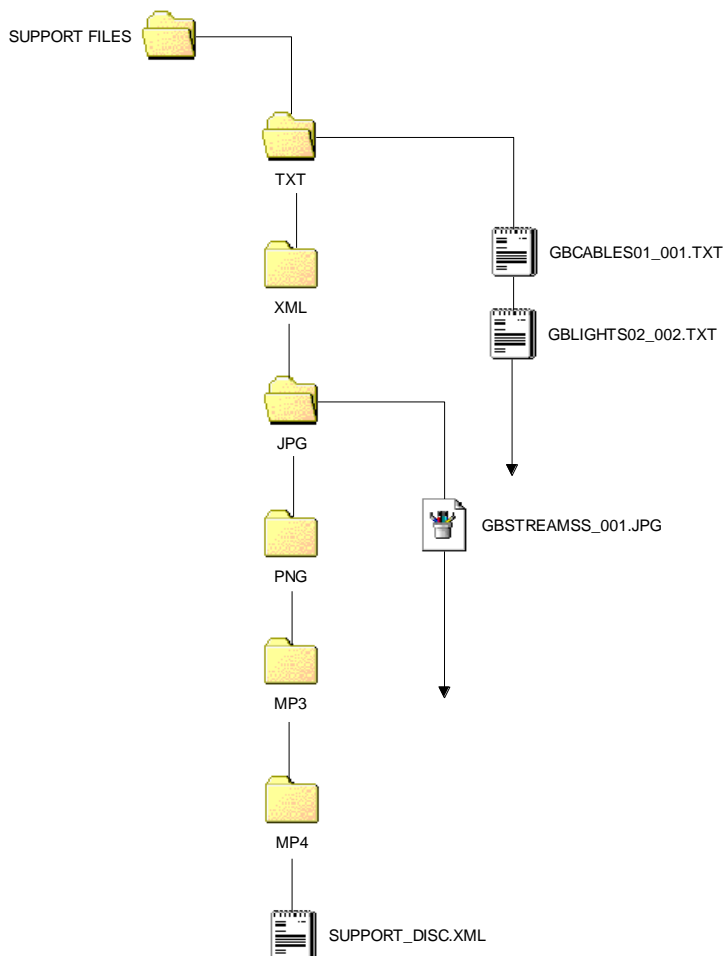
Another point for possible discussion is whether it is necessary to provide an additional link between the support files and the ENC(s) that refer to them. This is not really an issue with unencrypted exchange sets but could be for encrypted ones. Creating a link between these files and the ENC(s) could reduce the number of files that are stored on the system, i.e. only importing support files that relate to licenced cells. However this may be considered unnecessary due to the increased processing speeds of computers and the larger hard disc being used.

If it is agreed to use the method described above for flagging T&P notices then it would be desirable to have a direct link to the ENC(s) affected.

7 Support File Locations

The "SupportFileDiscoveryMetadata" files will be stored in a location specified by the pathname field [filePath] defined in the Catalogue.xsd file. The "filePath" field in the "SupportFileDiscoveryMetadata" record identifies the actual location of the support file on the exchange set.

In instances where the exchange set is formatted with a hierarchal folder structure it would be preferable to have dedicated directory for support files. There would then be sub directories for the specific types of support file. The diagram across seeks to illustrate this.



For the purposes of integrated ENC services where the exchange set may include ENCs from a number of different countries, the "Support File" directory could be located at the country level. This would mean that each country's support files would be held separately.

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UKHO
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Example of a possible Folder/File Structure

ANNEX A
Extract from the First Draft of S-101

S-101 Catalogue File (Catalogue.xsd)

Name	Crdnlty	Value	Type	Remarks
metadataFileIdentifier	1		CharacterString	Should this be changed from a mandatory in S-100 part 3
metadataPointOfContact	1		CI_ResponsibleParty	
metadataDateStamp	1		Date	YYYYMMDD
metadataLanguage	1	English	CharacterString	All data sets conforming to S-101 PS must use English language
fileName	1		CharacterString	
filePath			CharacterString	
abstract	1		CharacterString	E.g. a harbour or port name, between two named locations etc.
purpose	1	{1} to {5}	CharacterString	1. New, 2. New Edition, 3. Re-issue, 4. Update, 5. Cancelled
specificUsage	1	{1} to {3}	CharacterString	Navigation purpose 1. Ocean Passage, 2. Costal, 3. Port Entry
editionNumber	1		CharacterString	when a data set is initially created, the edition number 1 is assigned to it. The edition number is increased by 1 at each new edition. Edition number remains the same for a re-issue.
updateNumber	1		CharacterString	Update number 0 is assigned to a new data set.
updateApplicationDate	0..1		Date	
issueDate	1		Date	
productSpecificationEditionNumber	1			
editionNumberS-100	1			
producingAgency	1		CI_ResponsibleParty	
displayScale	1	{1} to {12}	double	Display scale must be one of the 12 predefined scales detailed in Clause 4.1
horizontalGeodeticDatum	1		CharacterString	
verticalDatum	1		CharacterString	
soundingDatum	1		CharacterString	
boundingBox	1		EX_GeographicBoundingBox	
boundingPolygon	1		EX_BoundingPolygon	
comment	0..1		CharacterString	
cyclicRedundancyCheck	1		NonNegativeInteger	
layerId	1..*		Double	Identifies the relationship to other layers that are required to view the complete data set.