# United Kingdom S-124 Progress Update

Submitted by United Kingdom

**SUMMARY**

Executive Summary: This paper shares the results of S-124 research and development undertaken by the UK since WWNWS15 as well as outlining the conclusions of the Product Specification review.

Action to be taken: See 5

Related documents: None

## 1. Introduction

1.1. The UKHO is committed to developing S-124 Navigational warnings datasets by the planned date of January 2026 for NAVAREA and Coastal warnings. The UK continues to engage in the S-124 PT and subgroups.

1.2. The UKHO has worked with IIC Technologies to complete an independent product specification review of S-124 edition 1.0.0 against S-100 edition 5.2.0 on behalf of the S-124 PT. Many of the outcomes of this specification review have already been incorporated into S-124 Edition 1.5.0 as a result of this work.

1.3. Unless otherwise stated, the following is intended to share the research completed by the UKHO and is not intended to propose a way forward for either the UK or other information providers.

## 2. UKHO Goals

2.1. UKHO's strategic goals in respect of S-124 are summarised as follows:

- Co-production – the ability to produce both S-53 style textual navigational warnings as well as standards conformant S-124 simultaneously, with a minimum of overhead.

- Compactness – the ability to keep the length of S-53 navigational warnings to an acceptable length and number whilst maintaining their compatibility with international standards.

## 3. Development & Research

3.1. Co-production of S-124 and S-53 is a significant challenge. S-100 and S-124 provide no guidance on how such practicalities should be handled so information providers will be left to engineer their own solutions.

3.2. The overall aim of UKHO, like many data providers will be to have a single production system and data input function, compiling data in a form as close to S-124 as possible. The UKHO is planning either an S-124 first or "product-neutral" approach to co-production in its systems. As the current Navigational Warning System is end of life, the UKHO plans to create its own bespoke system.

3.3. The compiled data should be held as S-100/S-124, however, so that it can be unambiguously output as S-124 GML datasets. From this data a methodology for extracting S-53 should be developed.

3.4. The UKHO's requirement to keep navigational warnings simple, compact and uncomplicated could often be at odds with the extensive encoding possibilities available in S-124. Therefore, the UKHO would encourage as much flexibility in encoding of warnings using S-124 and for the DCEG to give guidance on encoding without being restrictive.

3.5. The UKHO in collaboration with IIC Technologies used a generic S-100 editing interface to encode some sample data based on previously issued warnings. (fig. 1).

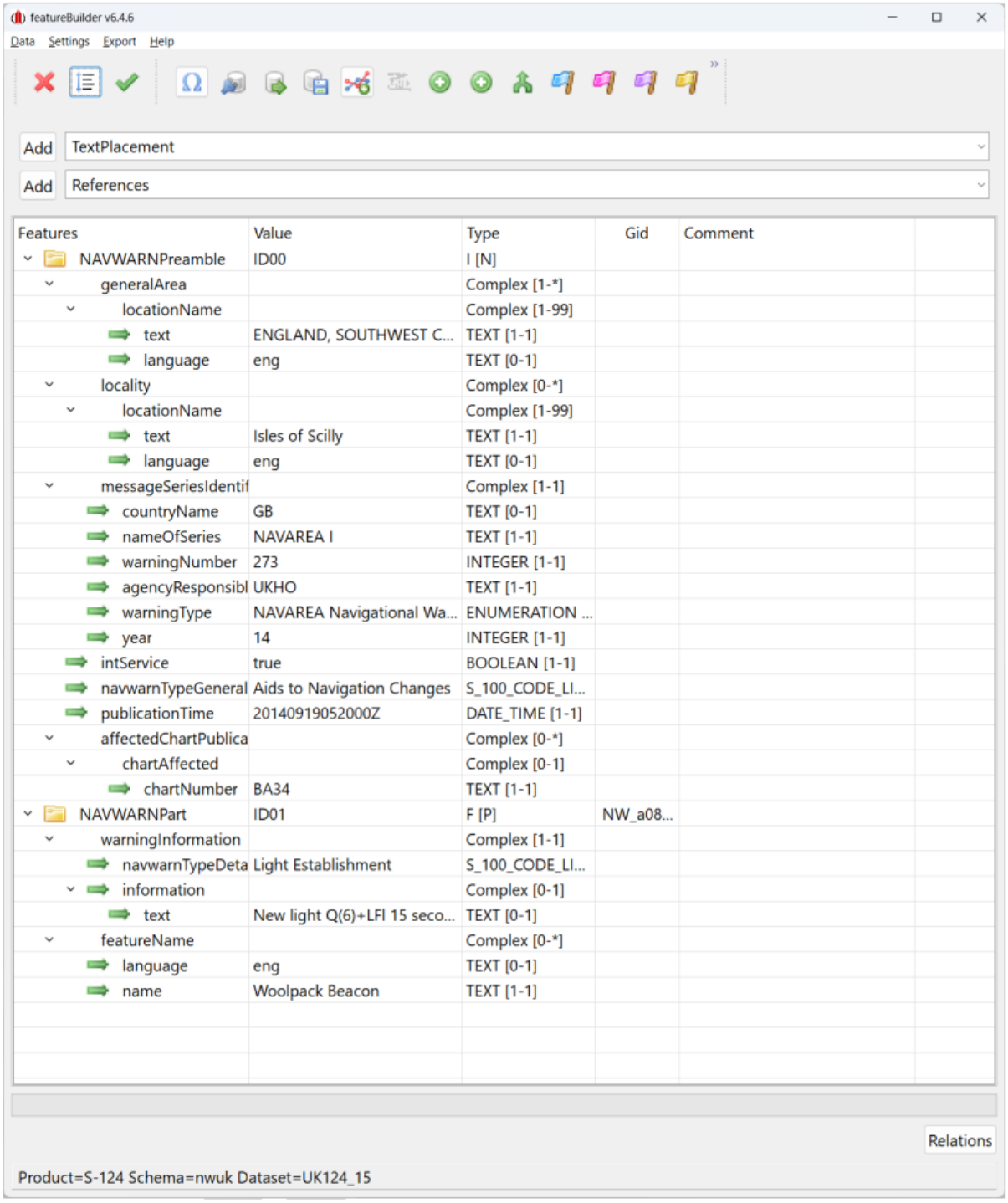
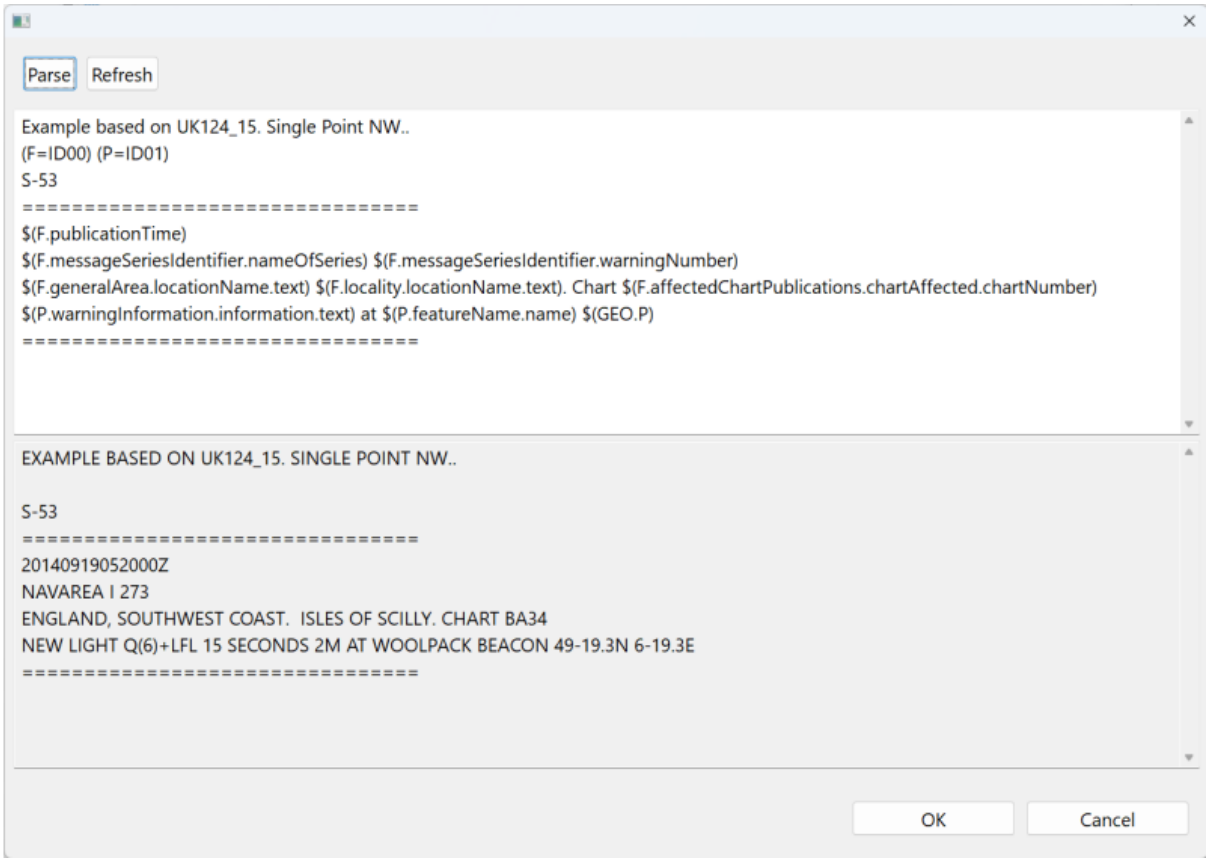



**Figure 1 S-124 dataset compiled in generic S-100 editing interface**

3.6. From this we were able to reproduce an S-53 warning. The Text Rendering popup shown in the following image allows the features to be specified, and then applies the dataset within the application to the template, generating the text below. As can be seen this allows for simple and complex attributes to be embedded from different features, and also renders geographic positions between the 7 decimal places in the S-124 and the Degrees/Decimal Minutes.




3.7. The text in the bottom half of the popup shows the S-53 "form" of the S-124 dataset. This is compiled completely from the S-124 data, with the layout defined in the template. The template defines a mapping between variable names and the Object ID of the individual features/information types in the current dataset. Substitutions are then defined by using a "$(…)" assignment which substitutes named simple attribute values in the outputs text. This also includes specific functions, e.g. "GEO" which reformats geometric primitives into degrees and decimal minutes with N/W and E/W qualifiers. These functions are extensible and could be used for enabling more complex/rich data transformations.

3.8. Would this work in general for S-124 NWs? It would require several templates dealing with the different data arrangements of most NW datasets – largely many NWs have the same structure, and one template should be applicable to many different NWs with different subjects, locations and textual content. This allows for maximum flexibility, defining new templates whenever the required S-53 text cannot be obtained from a pre-existing template. It does have an impact on how S-124 is encoded, meaning UKHO would need to have a tight encoding guide, based on the DCEG. It would also be possible to add attributes/sub-attributes to the S-124 data

model in the production system if they were required by templates to simplify how S-53 data is extracted from the database.

3.9. This process is similar to "conversion" of S-124 to S-53 but because data is drawn from an S-100 database and used to make two products it is really "co-production" from a common source rather than an "extract then convert" process. The crucial difference is that if required, data can be drawn from other (S-100 sources) and the ability to extend the S-124 data model to improve the transformed data.

3.10. It would be necessary to add a final "edit" stage before storing and issuing the transformed text, especially with more complex warnings, but the experience of creating and using templates with sample data suggests that simple S-53 warnings can be reproduced without additional editing at the final stage.

3.11. The key to successful co-production using this method, therefore, would be:

- A detailed information provider specific S-124 encoding guide, based on the DCEG and S-124 data model which encodes data in a way which is compatible with defined templates for co-production.
- A rich set of substitutions and language functions to enable production of meaningful S-53 data.
- A set of templates which capture the different data arrangements within S-124. These can be developed iteratively by working with large sample datasets. This implicitly defines the acceptable S-53 layouts which should be approved by producers for their NW distribution.

3.12. Other methodologies of co-production need to be explored to ensure feasibility and cost-effectiveness.

3.13. If this methodology were to be used it would be advantageous for multiple NAVAREA and National coordinators to use the same technology rather than have to develop the same software multiple times. Using either XSLT or Lua S-100 Portrayal Rules could be used to generate such messages. This would have the advantage of being supported by supporting S-100 software.

3.14. Distribution and safety of content has not been thoroughly reviewed, however the UKHO believes some verification checks will need to be completed as part of a co-production system to ensure the S-124 dataset and the S-53 warning represent the same information, however it is likely, purely because of the textual nature of the S-53 data output, that a manual step will be required as a final check to assure safety.

## 4. Conclusions from Product Specification review

4.1. Generally, S-124 is in a strong position to be "S-100 edition 5.2.0 compatible". It needs some changes but contains little which is "incompatible" with the current edition of S-100 edition 5.2.0. The biggest issue is the amount of duplication between S-124 and (earlier editions of) S-100. Once this duplication is replaced with references to S-100 the number of mismatches will be reduced considerably.

4.2. Most of the issues raised are editorial in nature. There are some deeper topics raised but nothing critical to the integrity of S-124 as an S-100 product specification.

4.3. The model is basically sound and has been tested carefully by the working group by "mocking up" encodings in the DCEG. Although there are some incompatibilities (i.e. attribute names, inconsistent table layouts and some gaps in functionality) this practice actually tests the model very well and provides good sources of comments. We would not expect the model to change dramatically.

4.4. Many of the comments made were designed to decrease the complexity of the product specification documentation by taking out duplication between S-124 and S-100.

4.5. Some product specific functionality was noted in the product specification review. This was presented briefly at the most recent S-164/S-98 sub-WG meeting, and an action taken to progress this between the subgroup and the S-124PT. This will require some consensus with the group of S-164/S-98 stakeholders to ensure the S-100 ECDIS functionality is properly specified and reflected in the IHO standards. The slides shown in **Annex A** reproduce some parts of the product specification which define S-100 ECDIS functionality. These will need to be progressed through the S-164 and S-98 Sub Working Group and the functionality embedded into the relevant standards for implementation by ECDIS OEMs.

4.6. Some additional observations were made which may be relevant to the group:

- Should PointSet as a geometric primitive be adopted? It would make the encoding of NWs with multiple locations substantially easier and their translation into S-53 style text much more straightforward. The current DCEG methodology of splitting points into multiple NavWarn parts with (potentially different) textual information would be difficult to render into S-53 text.

- Try to keep S-124 encoding flexible for the data producer. It is clear that a rigid encoding, encapsulated by the DCEG could hamper the ability to co-produce S-53 and S-124 format data.

- The lack of support for encryption services – all data will require digital signatures under S-100 Part 15, however some producers may wish to include S-124 data as part of an encrypted service, even though the information is being made available at no cost. Should the ability to encrypt S-124 data be retained leaving it to the producer to ensure an unencrypted source is always available?

- Better Validation tests which are product specific. Many of the existing validation tests can be done at the S-100 level and are not S-124 product specific.

- Ensure all the different permutations contained in the model/Application Schema are exercised in the DCEG.

4.7. The full input to the S-124 PT chair is contained in **Annex B**.

## 5. Recommendations

5.1. Invite the sub-committee to note the paper.

## Annex A – Slides presented to S-164 Sub-WG on S-124 Product specific functionality

S-124 - 1

**10.2 Dataset loading**

**10.2.1 Use of S-124 in ECDIS**

In ECDIS all valid S-124 datasets must always be loaded. Validity is indicated by the **cancellationDate** attribute in the **NAVWARNPreamble** class, and any point in time prior to this time value the dataset is valid. If the **cancellationDate** attribute is empty this means the dataset is valid until cancelled by a new dataset. Validity is terminated if a cancellation dataset is issued before the **cancellationDate** of a dataset.

Validity is also indicated by the NAVWARN being present in the latest in-force bulletin. Any dataset prior to and not found in the latest in-force bulletin must be considered not valid.

**10.2.2 In-force bulletin**

If the in-force bulletin contains one or more NAVWARNs that are not present in the system, an indication should be given.

S-124 - 2

**12.1 Portrayal requirements of the Graphical User Interface**

A dedicated interface is required to provide users with interaction with NAVWARN messages. This interface should be linked to an individual user so that the risk of missing information during watch handover is reduced. This interface shall, at a minimum, provide functionality for;

a) The user shall be able to tag individual messages according to the filtering requirements in section 12.2.
b) Capability for a call listing of all NAVWARN messages in the system and sorting these according to: received date and time, issue date and time, warning type, producer and series, must be provided. Additionally, a means to list according to user classification should be provided.

c) Provide an indication when a new NAVWARN message is received until it has been displayed or 24 hours have passed. This indication may be suppressed if the NAVWARN message does not meet filtering criteria set by the mariner (see 12.2).
d) Means shall be provided for the operator to enter criteria for filtering of indication of new NAVWARN messages based on time and distance from own ship, monitored route or planned route (see 12.2). Default setting is no filtering.
e) Details of the filtering options that have been enabled by user must be readily available for inspection and modification.
f) Means shall be provided to view the most recent message, past messages, and to view messages associated with selection of NAVWARN symbols in the graphical display area.
g) Listing of all NAVWARN shall include means for viewing an abbreviated view of any **NAVWARNPart**, **warningInformation** attributes present.

NOTE: It may be possible to create much of this functionality via portrayal context parameters, however, in this version of S-124, this is not included as further trials on S-100 portrayal are needed to assess the feasibility.

S-124 - 3

### 12.2 Filtering Navigational Warning information

S-124 navigational warnings datasets are intended for use in S-100 ECDIS as elements of an always on layer conforming to S-98 Level 1 interleaving when interoperability is on. There is a risk of clutter with this level of interoperability and it is therefore necessary to include filtering options for the user, to all the removal of not relevant information from the portrayal.

NOTE: Even though a navigational warning is not portrayed, it must still be visible and discoverable in a list of NAVWARNs that can be recalled by user action at any time.

User systems should provide filtering mechanisms for the Navigational Warning information.

At a minimum, functionality must be included that allows the user to classify the relevance of a NAVWARN against the intended route as:

- on chart (relevant for the route, must always be visualized), or;
- off chart (not relevant for the route, and need not be visualized), or;
- information (relevant for the route, but for information and need not be visualized).

On chart should be the default classification for all NAVWARNs.

Additional filtering functions could include options such as;

- filtering on route with a buffer;
- navigational warning topic;
- date range of the hazard;
- valid time of the navigational warning.

These filters could be used to assist the navigator in classifying a NAVWARN according to its relevance for the route.

## Annex B – Results from product specification review of S-124 edition 1.0.0

| Product Spec Location | Comment |
|---|---|
| General | Camel case and S-100 naming conventions are not being adhered to in the naming of all the model elements as it is required to capitalize NAVWARN. It might be worth noting this in the preamble to the product spec, maybe section 1.4? this doesn't cause a problem but it is non-standard and worth noting. E.g. NAVWARNPart, NAVWARNAreaAffected etc… |
| 1.3.1 | Revise S-100 version in References. Not sure S-62 is required here. |
| 1.1 | *S-124 has been designed to permit utilization of S-124 datasets in creating Navigational Warnings for*<br><br>Could be:<br><br>S-124 has been designed to enable creation of Navigational Warning datasets for… |
| 1.4.2 | Not sure much of the glossary is useful. Certainly the more esoteric NOTEs on p4 for feature association, attribute etc… will be lost on many implementers and belong in S-100, not S-124. Suggest the glossary is made more concise. |
| 1.5 | Specific Purpose:<br>The purpose of this document is to respond to requests to produce a data product that can be used in a Navigational Warning Information Overlay (NWIO) within an Electronic Chart Display and Information System (ECDIS).<br><br>"as" instead of "in" |
| 4.1 Relationships | May be worth referring the reader to the examples in the DCEG at this point as the relationships are best understood by example. Para 2 says "will as such appear as one NAVWARN", maybe "constitute a single NAVWARN" ? Leave portrayal out of it for now. Logically, the aggregation of all the feature and information types should be understood as a single NAVWARN? |
| NAVWARNAreaAffected | I couldn't see any examples in the DCEG of NAVWARNAreaAffected. Is is possible to add some? This may have changed according to the version I have but it's a very crucial part of the encoding. |
| 4.3 | Reference to feature catalogue in "chapter 5" – should probably be to the appendix where the FC is located?... |
| 4.3 | navwarnTypeGeneral this is an open codelist with a restriction of "other:*" which I believe allows data producers to define their own values as long as they begin " "other:" – I'm not sure this is frequently used and current COTS will struggle with this. Maybe better to include a text attribute which can be filled in if an "other" enumerate is selected. ? |
| 4.3 | Page 15 talks about ENCFeatureReference. Should this be replaced by interoperabilityIdentifier? It alludes to use of an MRN as an identifier to features held within ENCs and so it should probably be replaced with interoperabilityIdentifier and a reference to S-100 for the mechanism by which interoperabilityIdentifier can link to other ENC features. |
| 4.2/4.3 | Much of 4.2 and 4.3 is actually generic encoding advice. It may be worth relocating some of the text to an introductory section in the DCEG, leaving only the actual model description in the product specification? |
| 4.3 feature name and 4.4 | The reference to how featurename/displayName works may need revision when the use of multiple languages is (finally) enshrined in S-98 Annex C. As discussed, S-124 and other product specs may have to follow suit with how S-101 is approaching use of multiple languages (replacing National Language in S-57). |
| 4.4 | It may be worth differentiating between the use of multiple languages in feature attributes such as names and the use of language packs for the translation of fixed elements of the feature catlaogues, including all the enumeration values. |

| Product Spec Location | Comment |
|---|---|
| 4.4 | *When **intService** is true, then it is mandatory to provide all text in the attributes of text data type using the English language, while any local languages can be added where appropriate.*<br><br>This should be a validation test (and also described in the DCEG) – does this also affect metadata values in the exchange catalogue entry too? |
| 4.4 | *The language pack must therefore be present in the user system to work as intended.*<br><br>This is part of S-100 really and S-164/S-98 Annex C. Probably not needed here. |
| 4.3 | The Soft list helps implementers of production systems to design interfaces that allow a logical filtering of values. This filtering is intended to enable a simpler production process and remove illogical choices from the process<br><br>Selection of these should be a validation test (e.g. a warning if you select incompatible General/Details categories) |
| Section 5 | The following are described in S-100 Part 3 and part 5 and do not need to be repeated in the product specification.<br>5.2<br>5.3<br>5.4 (the table can be referred to S-100 Part 1 Table 1-2 and 1-4.6)<br><br>There's a comment in 5.4 "Note: Since S-124 uses XML formats for both datasets and metadata, the XML encoding must be used." but I think this is covered completely by Part 10b? |
| 5.6 | 5.6 adds little to the product specification, it could merely state the geometric primitives supported and refer to S-100 Part 7 for how they are derived from the ISO types. The reference to SpatialUncertainty is worth preserving but the rest is already defined adequately in S-100. Figure 5-2 doesn't really add much other than stating that spatial uncertainty is achieved by reference to a common information types which details (qualitatively) the reliability of the positional information. The abstraction from ISO19107 and GM_Orientable Surface simply isn't useful… (it's part of S-100 Part 7 so why repeat it). |
| 6.1 | I don't believe there are any attributes which hold depth information? So, any vertical datums would be described textually, which 6.2 states. 6.1 should probably include the word textually, to clarify and agree with 6.2? |
| 6.2.1 | Insert word "described" as below in bold (similar to last point):<br><br>*Although all coordinates in a dataset must refer to the same horizontal CRS, different Vertical Datums can be used for the depth or heights* **described** *in Navigational Warning datasets. The S-124 data must use meter for heights when included. The amplifying text in the sub attribute **information** of the **warningInformation** complex attribute may include information about heights or depths. When this is the case, the vertical datum used in the measurement shall be made clear from the text.* |

| Product Spec Location | Comment |
|---|---|
| 6.2.2 | Is there a good reference for UTC (ISO19108?) particularly the format used in NW text.? |
| 7.1 | 7.1 states that quality of position should be set by default. This isn't the case in most of the current DCEG examples. |
| 7.1 | The comment on validation should be expanded to include both types, validation against the feature catalogue and GML schema (which covers the generic S-100 level validation) and S-124 specific tests which are defined in the product specification. Second to last sentence of 7.1 should probably describe this better (i.e. make a reference to specific vs generic checks). |
| 9.1 | Second sentence is generic (S-100 defined). Might be useful to explain why there is no coverage feature, and what coverage means in terms of NW here with the detail included in 9.10? |
| 9.1.1 | Second sentence is generic and can be deleted. |
| 9.2 | Second and third bullet points don't need to be included. Second is part of GML and 10b, third is optional and doesn't add anything. |
| 9.5 | 9.5 adds little, other than saying all the mandatory attributes are included in the Fc. The bullet points only illustrate what's in S-100. |
| 9.7 | Is defined in schemas of 10b. It also references multi-point and current draft doesn't uinclude multi-point. I think 9.7 could be deleted. |
| 9.8 | Needs to be clearer about how identifiers are implemented, i.e. as the message series identifier. The MRN references probably aren't useful but could talk about interoeprabilitIdentifier and refer to the MRN sections of S-100. Third paragraph adds nothing, is part of Part 10b. |
| 9.9 | Could just refer to S-100 Part 7 for the definition of Level 3a rather than restate it. The third bullet of the S-124 constraints should be referred to the maximum permitted display scale of the largest scale underlying ENC? The NW datasets themselves have no maximum permitted display scale as the data is unscaled. |
| 9.10 | Worth saying what the data coverage represents, i.e. the extent in which NW data may exist. |
| 9.10.1 | I'm not sure this is because of limitations in user systems. Better to just say they don't cross the meridian. |
| 9.12 | Should include the text on including quality of position with each dataset with this paragraph which groups all the clauses about data quality together. |
| 9.13 | Nautical should be Navigational in first sentence. |
| 10.1 | Unless there's a really good, ISO reason why table 10-1 is included it could be takern out. I'm not sure what it adds. IT also says the language is English when it could be other languages too? GML version I believe is now 3.2 (3.2.1 was taken out in 5.0.0 of S-100). |
| 10.3 | 10.3 should really refer to the Part 17 mechanisms for cancellation as well as those within the dataset.?<br><br>**Any mechanism for cancellation not already in Part 17 will need to be agreed with ECDIS stakeholders.** |
| 10.4 | "support" should be "implement" in the language of Part 10b. IT should be clear this is an S-124 restriction, not a restriction of S-100. |
| 10.5 | This copies heavily from Part 17 of S-100 and could probably be shortened |

| Product Spec Location | Comment |
|---|---|
| | for brevity.<br><br>1st sentence 1st para is fine. E.g:<br><br>Datasets which conform to this product specification must be delivered as a component of an exchange set which complies with Part 17 of S-100. The S-100 Exchange Set structure is set up to facilitate machine reading of the datasets, and this is in part done with metadata . The S-124 Exchange Set structure is the same as that described in S-100 Part 17. An S-124 exchange set should consist of one or more S-124 datasets with any associated supporting resources, feature/portrayal catalogues, a single Exchange Catalogue XML file containing metadata. It may also include one or more support files.<br><br>Figure 10-1 can be deleted along with the first note.<br><br>The only S-124 specific elements are:<br><br>• S-124 does not specify the usage of ISO Metadata File<br>• S-124 allows exchange sets to include only support files that are language packs<br><br>The second bullet is a direct consequence of the model though (you couldn't include a support file even if you wanted to as there's no place in the model for it)<br><br>This para:<br>*It is important to align the Exchange Set creation workflow with the data integrity and security provisions outlined in S-100 Part 15. These provisions cover digital signing of Exchange Set resources. All resources within an S-100 Exchange Set must be digitally signed and their signatures included in the Exchange Set Catalogue. S-124 Exchange sets should not be encrypted or compressed.*<br><br>Should just be:<br>**It is important to align the Exchange Set creation workflow with the data integrity and security provisions outlined in S-100 Part 15. S-100 Part 15 defines the requirements and process for creation and verification of digital signature values and production of compressed/encrypted datasets.**<br><br>"S-124 Exchange sets should not be encrypted or compressed." Why not? If there's a reason it should be stated. (Also the metadata section doesn't restrict the values of the compression flag). I think compression in S-100 file encodings would be fine (Accepting that SECOM or other comms don't require it)? |

| Product Spec Location | Comment |
|---|---|
| 10.6 | 50Kb? If there's a rationale it should be stated. |
| 10.7 | This is replicated from S-100 Part 17. It can be deleted. There is a possible justification for<br>• describing how the data producer is the issuing agency of the navwarn<br>• that filenames are limited to 15 characters (S-100 has them unlimited) but I'm not sure that's a limitation you want to impose.?<br>Otherwise just refer to S-100 Part 17 for naming conventions on datasets and supporting resources. |
| 10.8 | This appears to be replicated from Part 17 and could be deleted completed. I can't see anything specific to S-124 in the list. The diagram is nice, but it replicates Part 17 again. (and the .zip extension is possibly incorrect on the PC). Best to leave to S-100 |
| 10.3 | Cancellation needs to reference the methods for cancellation defined in Part 17 of S-100. |
| 12.1 | This part will need some replication within S-98 Annex C. It can only be implemented on the ECDIS in this way.<br>12.1(a) "requirements" should probably be "criteria"<br>12.1(b) this would be equivalent to all S-124 datasets currently loaded into the system database. This is provided by S-128 and update Status Report but I think you mean a list only of S-124 datasets (without all the other datasets in the system) – this may need an S-164 test as well.<br>12.1(c) what does "received" mean in the context of S-124? Is it the same as "installed". |
| 12.2 | 12.1 and 12.2 and 12.3 are parts of the same section really, why not make them 12.1.1, 12.1.2 and 12.1.3? Then they fit together logically. These sections should be considered separately for ECDIS inclusion and then edited in the product specification to reflect what is agreed with the ECDIS stakeholders. |
| 13.1 | Second sentence of the introduction is not really saying anything. Second sentence – are you referring to optional attributes here? Unlikely S-124 would remove mandatory attributes?<br><br>The tables should really only detail any S-124 restrictions, not restate the contents of Part 17.<br><br>**Diagram 13-**1 I think shows only the Part 17 elements which are allowed in exchange sets, any others should be considered explicitly not allowed (and this could be a vliadiotn test)? Is this right? If so, the text in the introduction should more clearly introduce the diagram. Also need to state whether vales are mandatory or not (i.e whether S-124 mandates some optional (according to Part 17) values, e..g specificUsage<br><br>Having looked at diagram 13-1 alongside S-100 5.2 the only differences are the 8 values dropped from datasetdiscoveryMetadata, otherwise the whole thing is reproduced from an earlier S-100 edition. The dropped entries are<br>• editionNumber<br>• updateNumber<br>• updateApplicationDate |

| Product Spec Location | Comment |
|---|---|
| | • referenceID<br>• DataCoverage<br>• replacedData<br>• dataReplacement<br>• navigationPurpose<br><br>I think dataCoverage, replacedData and dataREplacemetn possibly should be included.<br><br>Why disallow DataCoverage? Surely it would be better for producers to accurately include a coverage in the catalogue which is more detailed than a bounding box? |
| Tables in Part 13 | 13.2.1<br>defaultLocale<br>otherLocale<br><br>13.2.1.1<br>S100_ExchangeCatalogueIdentifier (why is this standardised?) – need to state concatenation character (example uses "_")<br>It also mentions edition number but it's not listed in the table?<br><br>13.2.2<br>Description<br>dataProtection (are you really explicitly disallowing encrpyion of S-124?)<br>purpose<br>specificUsage (is this mandatory, not clear?)<br>temporalExtent<br>metadataPointOfContact (check 5.2.0)<br>defaultLocale<br><br>13.2.3<br>Mentions datasets, this is support files though. And it's all Part 17.<br><br>13.2.2.2 – include Example only.<br><br>13.2.2.4<br>Name<br>Version<br>Date<br>productIdentifier (check)<br>compliancyCategory<br><br>13.2.3<br>Needs purpose restricting to language pack.<br>editionNumber (maybe? Does S-124 have new editions?) |
| Appendix D | Validation framework can probably be referenced elsewhere. |

| Product Spec Location | Comment |
|---|---|
| | What is MTM?<br>Para 3 should probably be refined. Some checks will have greater severity than others but there shouldn't be any critical errors.<br><br>Some suggested validation tests specific to the S-124 model (as opposed to those which are at the S-100 level)<br><br>1. 10.1 keep<br>2. 10.2 – not sure this is correct? It's GML anyway, delete<br>3. 10.3-11.4 – all generic, delete<br>4. 11.7 keep<br>5. 11.8 you can delete if you just use the S-100 file naming convention<br>6. There should be a test for any metadata fields outside the list, values and multiplicities defined in part 13.<br>7. 12.0-12.7 – all generic (FC or framework I think). Date tests are probably required but these are generic<br>8. 12.8 keep.<br>9. 12.9 keep.<br>10. 13.0 keep<br><br>Some suggestions:<br>i. Incorrectly formatted exchange catalogue identifiers (table in section 13 format) including concatenation character<br>ii. Identifiers with dates in the future?<br>iii. Need to filter out CATALAOG.XML where forbidden fields have been set (or enum values).<br>iv. Periodic dates in the body text but not encoded.<br>v. Similarly, other examples where attribution is in the text of the NW but not in the attribution of the feature – see note below.<br>vi. Other data types and purposes.<br>vii. Other entries in support files (only language packs)<br>viii. No data quality indication<br>ix. Encryption (not allowed)<br>x. intService is set, all text should be in English?<br><br>(iv) Should there be any warnings for S-124 which doesn't meet the DCEG guidelines. This is difficult because the DCEG is mostly example based. So, where there is periodicity in the text but not in the attribution, similarly names. Geometry choices might also be good to validate on but could be subjective. I think once a more in depth reading of the DCEG is done , then more validation tests will emerge…<br><br>Take out Annex A – it is not required. It will be located in S-100's generic tests somewhere and can be referenced at a later date. |
| Appendix F | This could contain the summary of what is required from the ECDIS in respect of S-124, leaving the product spec with more explanatory text and background. This should be agreed with ECDIS stakeholders though before final drafting. |

**Annex C – S-124 Feature Catalogue comments**

These comments were sent to the S-124 PT chair and specifically relate to the feature catalogue, and associated Application Schema:

1. Why is year a separate field in the identifier? Shouldn't it be inferred from the publicationDate? Or maybe (particularly at new year) there could be a possibility that a NW from Year N is published in year N+1? I think it's worth considering though.

2. What if each NAVAREA had its own enumeration value in warningType? That would make validation of position trivial? Otherwise it has to be parsed from nameOfSeries… If you were able to simply pick the relevant NavArea from a list the validation of position would be much much easier. Also, the areas hardly ever change so there shouldn't be any problem hardwiring them into an enumeration.

3. Why isn't chart affected 0..*, instead of 0..1 in the model. In the current model, if I want to include more than one chart affected I need to have a whole new instance of affectedChartPublications. In the current FC the multiplicity of affectedChartPublications.chartAffected is 0..1 so you can only have one normal chart affected, and I imagine there are cases where more than one chart would be affected.

4. displayName is gone. Use nameUsage=1 and Language is now mandatory in any featureName construct. This looks like it is going through in ENC and we should probably align with it in S-124. The changes are actually minimal.

5. FC. displayName is gone. Use nameUsage=1 and Language is now mandatory in any featureName construct. This looks like it is going through in ENC and we should probably align with it in S-124. The changes are actually minimal.

6. Check Associations of AreaAffected – does it link to Preamble or one or more parts? It's not entirely clear and there are no examples in the DCEG which we can cross-check against.

7. Support PointSet/MultiPoint, please. There are use cases for it, if only to reduce duplication of text and attribution. It seems unlikely that every navigation warning referring to >1 point requires separate parts. Seemed to be supported at the DCEG meeting too. I agree this could lead to lazy encoding but that could be tackled through the DCEG and validation tests on NWs that use PointSet. I think where the text applies equally to each point in the set, and where the area affected is not a function of each individual point there is a good case for making the application of the DCEG simple.

8. DateStart/DateEnd – need to check alignment of S-98 and use of date dependent features with what is in S-124.

**Annex D – S-124 GML examples**

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<Dataset xmlns:S100="http://www.iho.int/s100gml/5.0"
xmlns:gml="http://www.opengis.net/gml/3.2"
xmlns:s100_profile="http://www.iho.int/S-100/profile/s100_gmlProfile"
xmlns:xlink="http://www.w3.org/1999/xlink" gml:id="DS1">
   <S100:DatasetIdentificationInformation>
      <S100:encodingSpecification>S-100 Part 10b</S100:encodingSpecification>
      <S100:encodingSpecificationEdition>1.0</S100:encodingSpecificationEdition>
      <S100:productIdentifier>S-124</S100:productIdentifier>
      <S100:productEdition>1.0.0</S100:productEdition>
      <S100:applicationProfile>1</S100:applicationProfile>
      <S100:datasetFileIdentifier>XXXIC000000.GML</S100:datasetFileIdentifier>
      <S100:datasetTitle>Sample GML Encoding</S100:datasetTitle>
      <S100:datasetReferenceDate>2001-04-22</S100:datasetReferenceDate>
      <S100:datasetLanguage>eng</S100:datasetLanguage>
      <S100:datasetTopicCategory>oceans</S100:datasetTopicCategory>
      <S100:datasetPurpose>base</S100:datasetPurpose>
      <S100:updateNumber>0</S100:updateNumber>
   </S100:DatasetIdentificationInformation>
   <members>
      <NAVWARNPreamble gml:id="ID00">
         <generalArea>
            <locationName>
               <language>eng</language>
               <text>IRISH SEA. </text>
            </locationName>
         </generalArea>
         <locality>
            <locationName>
               <language>eng</language>
               <text>Nymphe Bank North-eastwards.</text>
            </locationName>
         </locality>
         <messageSeriesIdentifier>

<agencyResponsibleForProduction>UKHO</agencyResponsibleForProduction>
            <countryName>GB</countryName>
            <nameOfSeries>WZ</nameOfSeries>
            <warningNumber>581</warningNumber>
            <warningType code="2">Coastal Navigational Warning</warningType>
            <year>23</year>
         </messageSeriesIdentifier>
         <intService>true</intService>
         <navwarnTypeGeneral code="-1">other:</navwarnTypeGeneral>
         <publicationTime>20230804134000Z</publicationTime>
         <geometry/>
      </NAVWARNPreamble>
      <NAVWARNPart gml:id="ID01">
```

```
        <warningInformation>
          <text>M5 buoy unlit.</text>
          <navwarnTypeDetails code="-1">other:</navwarnTypeDetails>
        </warningInformation>
        <header xlink:arcrole="http://www.iho.int/S-
124/gml/1.0.0/roles/componentOf/header" xlink:href="#ID00"/>
        <geometry>
          <S100:pointProperty>
            <S100:Point gml:id="PID01">
              <gml:pos>-6.71 51.69</gml:pos>
            </S100:Point>
          </S100:pointProperty>
        </geometry>
      </NAVWARNPart>
   </members>
</Dataset>
```

---

```
      <S100:productEdition>1.0.0</S100:productEdition>
      <S100:applicationProfile>1</S100:applicationProfile>
      <S100:datasetFileIdentifier>XXXIC000000.GML</S100:datasetFileIdentifier>
      <S100:datasetTitle>Sample GML Encoding</S100:datasetTitle>
      <S100:datasetReferenceDate>2001-04-22</S100:datasetReferenceDate>
      <S100:datasetLanguage>eng</S100:datasetLanguage>
      <S100:datasetTopicCategory>oceans</S100:datasetTopicCategory>
      <S100:datasetPurpose>base</S100:datasetPurpose>
      <S100:updateNumber>0</S100:updateNumber>
   </S100:DatasetIdentificationInformation>
   <members>
      <NAVWARNPreamble gml:id="ID00">
        <generalArea>
          <locationName>
            <language>eng</language>
            <text>UNKNOWN</text>
          </locationName>
        </generalArea>
        <locality>
          <locationName>
            <language>eng</language>
            <text>UNKNOWN</text>
          </locationName>
        </locality>
        <messageSeriesIdentifier>

<agencyResponsibleForProduction>UKHO</agencyResponsibleForProduction>
          <countryName>GB</countryName>
          <nameOfSeries>WZ</nameOfSeries>
          <warningNumber>669</warningNumber>
          <warningType code="2">Coastal Navigational Warning</warningType>
```

```
            <year>14</year>
         </messageSeriesIdentifier>
         <cancellationDate>20140507141000Z</cancellationDate>
         <intService>true</intService>
         <navwarnTypeGeneral code="1">Aids to Navigation
Changes</navwarnTypeGeneral>
         <publicationTime>20140507141000Z</publicationTime>
         <theReferences xlink:arcrole="http://www.iho.int/S-
124/gml/1.0.0/roles/componentOf/theReferences" xlink:href="#ID02"/>
         <geometry/>
      </NAVWARNPreamble>
      <NAVWARNPart gml:id="ID01">
         <warningInformation>
            <text>North Arklow Light-buoy, normal conditions restored.</text>
            <navwarnTypeDetails code="158">Light Operating
Properly</navwarnTypeDetails>
         </warningInformation>
         <header xlink:arcrole="http://www.iho.int/S-
124/gml/1.0.0/roles/componentOf/header" xlink:href="#ID00"/>
         <geometry>
            <S100:pointProperty>
               <S100:Point gml:id="PID01">
                  <gml:pos>0.0 0.0</gml:pos>
               </S100:Point>
            </S100:pointProperty>
         </geometry>
      </NAVWARNPart>
      <References gml:id="ID02">
         <messageSeriesIdentifier>

<agencyResponsibleForProduction>UKHO</agencyResponsibleForProduction>
            <nameOfSeries>NAVAREA 1</nameOfSeries>
            <warningNumber>553</warningNumber>
            <warningType code="2">Coastal Navigational Warning</warningType>
            <year>14</year>
         </messageSeriesIdentifier>
         <noMessageOnHand>true</noMessageOnHand>
         <referenceCategory code="1">Warning Cancellation</referenceCategory>
         <geometry/>
      </References>
   </members>
</Dataset>
```