

Paper for Consideration by S-101PT
Use and Modelling of the UpdateInformation Feature

Submitted by:	AU
Executive Summary:	Changes in modelling and guidance are proposed for the UpdateInformation meta feature in accordance with discussions at S-101PT11 and Action S101PT11/33.
Related Documents:	S-101PT11-08.4 rev1; Action S101PT11/33 S-101 DCEG; S-98; S-164
Related Projects:	S-101; S-100 ECDIS performance

Introduction / Background

1. Discussions at S-101PT11 (September 2023) in relation to Paper S-101PT11-08.4 rev1 – *Use and Modelling of the UpdateInformation Feature*, resulted in the decision to update the modelling to facilitate the use of Update Information Features to potentially replace the current Update Review functionality in ECDIS. Action S101PT11/33 as proposed in Paper S-101PT11-08.4 refers.
2. An overwhelming majority of Data Producers recognise the benefits of **UpdateInformation** Features as the Review functionality in ECDIS compared to the current performance.

Analysis/Discussion

3. Discussions at S-101PT11 revolved around the workload that Data Producers would have to undertake in order to create these features for S-101 ENC's. There were discussions around the workflow's of Data Producers indicating that not every part of the production workflow is involved with the creation of Products and the compiler's may not be aware that they need to create these features in a Source Database in order to flow through to a Product in the future.
4. The AHO is of the opinion, the need for **UpdateInformation** features to only highlight the important changes in an S-101 Product rather than "all" features changed is vital to the functionality of this feature. If not implemented for important changes only, every object changed in the Product will be highlighted, giving the end user no benefit from the encoding.
5. The AHO believes that the application of these features within an S-101 ENC Product should replace the capability of ECDIS to display ENC Updates on Mariner Selection, as it will show a reduced clutter representation of the important changes to the products.
6. The AHO has been working with Teledyne CARIS to investigate the ability to semi automate the creation of **UpdateInformation** Features with HPD Production Software. As a result of the collaboration it was identified the need for a new Association Type (**UpdateComposition**) to efficiently handle **updateType** = (Move).

7. AHO's findings have been the creation of these features within an S-101 Product is a simple and meaningful task. The Features can be managed within the Source Database or at the Product Level depending on the Data Producers preference. The workflow that was used to create a test output dataset, involved adding an UpdateInformation Feature at each location identified whilst applying the Source changes to the product. An additional UpdateComposition association was also made to group these changes together. This was not an arduous task and didn't extend the length of the task by an unreasonable period based on the benefit outcome to the mariner. It was also done using a tool that hasn't had any automation applied as yet.
8. HPD Users will have the Option to choose which features, from a selection of all updated features, that will be of value to create an **UpdateInformation** relationship. Automation may not be required in every case; Data Producers will have the option to manually create/encode this feature within HPD.
9. Automation can pre populate the **updateNumber** and **updateType** fields.
10. Automation will create the newly proposed **UpdateComposition** Association where required. This association will link the **UpdateInformation** types "Delete" and "Insert" **UpdateInformation** Features that are associated with a "Move" instruction.

3.11 Update information

<u>IHO Definition:</u> UPDATE INFORMATION . The Update Information metadata feature is used to represent a change to the information shown.				
<u>S-101 Metadata Feature:</u> Update Information				
<u>Primitives:</u> Point, Curve, Surface, None				
<i>Real World</i>	<i>Paper Chart Symbol</i>	<i>ECDIS Symbol</i>		
S-101 Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
fixed date range		See clause 2.4.8	C	0,1 †
date end	(DATEND)		(S) TD	0,1
date start	(DATSTA)		(S) TD	0,1
update number			IN	1,1
update type		1 : insert 2 : delete 3 : modify 4: move 5: composition	EN	1,1
scale minimum	(SCAMIN)	See clause 2.5.9	IN	0,1
source			TE	0,1
information		See clause 2.4.6	C	0,*

file locator			(S) TE	0,1
file reference	(TXTDSC) (NXTDSC)		(S) TE	0,1 †
headline			(S) TE	0,1
language		ISO 639-2/T	(S) TE	1,1
text	(INFORM) (NINFOM)		(S) TE	0,1 †

Feature Associations

S-101 Role	Association Type	Associated to	Type	Multiplicity
Identifies	Updated Information (see clause 25.19)	All Geo features	Association	0,*
consistsOf	Update Composition (see clause XX.xx)	Update Information	Association	0,*
componentOf	Update Composition (see clause XX.xx)	Update Information	Composition	0,1

† For each instance of **fixed date range**, at least one of the sub-attributes **date end** or **date start** must be populated.

fixed date range and/or **scale minimum** are mandatory if **fixed date range** and/or **scale minimum** are populated for the associated Geo feature, and must be identical to the values populated for the associated Geo feature.

For each instance of **information**, at least one of the sub-attributes **file reference** or **text** must be populated.

INT 1 Reference:

1.1.1 Update information

The meta feature **Update Information** is used by the ECDIS to provide, on request, a visual indication to the Mariner of information that has changed in the System Database when an ENC Update is applied. Therefore, an associated instance of **Update Information** corresponding to each feature instance included in an ENC Update dataset (ER Application Profile) is mandatory for all changes that impact on navigation*. **Update Information** must be associated with features that have changed using the association **Updated Information** (see clause 25.19).

* Data producers may consider the non-inclusion of an instance of **Update Information** for minor changes to a feature that have no impact on navigation, such as correction of spelling/syntax errors in text strings or associated text files. For further guidance see Section 31.

Remarks:

- The mandatory attribute **update number** must be used to indicate the Update number of the Update dataset that the changed information is included in, as indicated in the file extension of the Update dataset.
- The mandatory attribute **update type** must be used to indicate the type of update applicable to the feature (insertion, deletion, modification, move, composition).
- The complex attribute **information** (see clause 2.4.6) may be used to provide a brief textual description of the changes to the associated feature as included in the Update.
- Where the changed information is related to an information type, the **Update Information** should be associated with the features to which the information type is associated.
- The attribute **source** may be used to indicate the related paper chart Notice to Mariner's number.
- At each New Edition of an ENC cell, **Update Information** features which are no longer relevant must be deleted; and for the next Update to an ENC cell **Update Information** features included in the previous Update dataset should be considered for deletion. Where a new Update impacts a feature that has previously been updated, any existing instance of **Update Information** associated to the feature must be deleted as part of the new Update; this must be done by deleting the existing **Update Information** from the dataset.

- The creation of **Update Information** meta feature instances and the corresponding **Updated Information** association instances may be substantively automated in ENC production systems and associated databases, with automated population of the mandatory attributes **update number** and **update type** based on the change made to the data; and the complex attribute **fixed date range** and attribute **scale minimum** based on the attribution of the associated geo feature. Any additional information populated for **Update Information** is at the discretion of the Data Producer.
- The creation of **Update Composition Association** **must** be used to associate the “Delete” and “Move” **UpdateInformation Features together for the repositioned features.**

Distinction: Information Area; Caution Area.

Update Composition

IHO Definition: **Update Composition.** A feature association for the binding between an Update Information feature and its component Update Information features.

Remarks:

- Useful to collect a group of updates such as when a series of deletes, inserts and modifies go together.

Role Type	Role	Associated With	Multiplicity
Composition	Component of	Update Information	0,1
Association	Consists of	Update Information	0,*

Conclusions and recommendations

11. The proposed amendments to the modelling for the S-101 **UpdateInformation** meta feature is intended by the AHO to replace the existing functionality of ECDIS. AHO believes it will provide the end-user an enhanced interaction/experience and provides a minimal impact on resources for Data Producers.
12. It is recommended that S-101PT:
 - Approve the revised modelling and guidance for the **UpdateInformation** meta Features and discuss any improvements that could be made;
 - Approve the replacement of the existing S-57/S-52 binary differencing method for the highlighting of S-101 ENC Updates at mariner request with the functionality of the **UpdateInformation** meta Feature.

Justification and Impacts

13. Inclusion of the functionality for the highlight of ENC Updates on mariner selection using the **UpdateInformation** meta feature at the dataset level with no requirement for implementation at the end-user system level will improve the capability for Data Producers to provide more meaningful information for such highlighting.
14. The automation of this functionality will allow the Data Producers to apply these features to their products in a simplified manner, thus saving time and effort on their part. The ability to manually manage these features will still exist if Data Producers wish to use their own procedure.

Action Required of S-101PT

15. The S-101PT is invited to:

- **Discuss** this proposal
- **Approve** the inclusion of **UpdateInformation** features into 2.0.0 Operational release with the modelling as it stands included and the addition of the **UpdateComposition** Association
- **S-98** Sub Working Group to review and update S-98 Annex C XXXXX (Section number) accordingly
- **S-164** Test Dataset Sub Working Group to update ENC Test Datasets for the proposed changes
- **Initiate** any further action as required.