**NIPWG8-30.2**

## Paper for Consideration by NIPWG

## [Completeness etc. of data sets possibly be provided by S-128]

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| ***Submitted by:*** | Hannu Peiponen |
| ***Executive Summary:*** | This paper describes the onboard ECDIS needs related to S-128 |
| ***Related Documents:*** | None |
| ***Related Projects:*** | S-100, S-128 |

## Introduction / Background

NIPWG7 in Nov 2019 discussed about role and content of S-128. The submitter of this paper expressed a view that S-128 could act as a gap filler for providing information based on which an onboard ECDIS could perform the task related to up-to-dateness of data in use and data hold within the ECDIS. For current S-57 based ENC such tasks are specified in IHO S-63.

## Analysis/Discussion

Use cases of the up-to-dateness

IMO SOLAS Chapter V Regulation 27 requires that ships carry up to date nautical charts and nautical publications.

Regulation 27

Nautical charts and nautical publications

Nautical charts and nautical publications, such as sailing directions, lists of lights, notices to mariners, tide tables and all other nautical publications necessary for the intended voyage, shall be adequate and up to date.

Various stakeholders in the maritime industry as whole have interest related to the this up to dateness requirement:

* Master of the ship and crew members need to ensure that their nautical charts and nautical publications are adequate and up-to-date for the intended voyage
* Port state control (PSC) inspectors need to inspect that the nautical charts and nautical publications for the incoming voyage and for the planned outgoing voyage are adequate and up-to-date
* Vetting inspectors (inspector working for cargo owners, etc. who might be liable for the damage caused by an incident of the ship) need to inspect that the nautical charts and nautical publications for the incoming voyage and for the planned outgoing voyage are adequate and up-to-date
* Master of the ship and crew members need to show evidence to port state control and vetting inspectors that their nautical charts and nautical publications are adequate and up-to-date for the incoming voyage and for the planned outgoing voyage

Evolution of the facilities to check the up-to-dateness

For the paper charts the up-to-dateness system was based on sequentially numbered notice to mariners. All parties knew what was the highest sequential number and inspection was based on studying the recording of the paper-based notices to mariners and their transfer as amendments into the paper charts by the crew members.

Initially the S-57 ENC charts included a system for electronic updates (i.e. provision to transfer the content of notices to mariners), but the S-57 system missed easy to obtain information about what is the latest edition and update number for each chart cell (i.e. same as the highest sequential number for paper based notices to mariners). Further the situation was made even worse by the fact that there was no single edition/update number for all ENC chart, but each chart cell had its own edition/update number. The S-57 ENC charts included “issue date” but that could serve the up-to-dateness only in case that all ENC charts are reissued for example once per week or once per month (i.e., possible to check that all issue dates are fresh enough).

More or less the practical situation was that no flag country administration accepted the use of S-57 ENC charts as replacement of paper charts to meet the IMO SOLAS Chapter V Regulation 27. Further when first flag countries started to issue Ship’s safety certificates which specified that this ship use ECDIS to fulfill the SOLAS Chapter V Regulation 27 for nautical charts, the port state inspectors start to stop the ship as they were unable to get enough evidence that things are adequate and up-to- date.

The solution was introduction of IHO S-63 which included a metadata file called PRODUCTS.TXT. This metadata file had one entry for all S-57 ENC charts available from the RENC who had published the S-63 compliant delivery package of S-57 ENC charts. The introduction of S-63 made it mandatory for an ECDIS to indicate permanently on screen if the viewed S-57 ENC charts plus the underlaying larger scale ENC charts were not up-to-date (SSE 27). This feature provided a possibility to check that the holding in an ECDIS were up-to-date, but the inspection required that a person operates the ECDIS and scroll trough the intended voyage and observes that the ECDIS does not pop-up the SSE27 warnings related to the up-to-dateness.

Some ECDIS manufacturers recognized that the provisions given for the crew and inspectors were not practical and they implemented on voluntary basis all kind of ECDIS up-to-dateness reports. The problem with these per manufacturer proprietary reports was that they were not part of international standardization, not part of official training of crew members and not part of official instruction for inspector how to conduct the inspection of the up-to-dateness.

This led to an initiative submitted by a few ECDIS manufacturers to IHO DSPWG to add a standardized “ENC Update Status Report” into the IHO S-63. Further as a consequence of upgraded S-63 the IEC testing standard for ECDIS, the IEC 61174, was revised to include mandatory implementation of the “ENC Update Status Report” as specified in S-63. Further the IHO S-64 IHO Test Data Sets and instructions how to use the test data set for ECDIS was also revised to cover the implementation of the “ENC Update Status Report”. The result was also that the type approval of an ECDIS covers correct implementation of the “ENC Update Status Report” – this is important for the legality of the use of the “ENC Update Status Report” as a proof that the nautical charts were adequate and up-to-date for the intended voyage.

Today the standardized form to report the up-to-dateness is everyday practice by crew members and inspectors. Conclusion from the evolution is that a machine managed method is essential for the digital alternative.

Requirement of the provision of the up-to-dateness for the S-100 based products

IMO SOLAS Chapter V Requirement 27 applies to nautical charts and nautical publications. From this fact one can derive that all S-10X products which are intended for onboard use by ships should be covered by a machine managed method of up to dateness.

S-128 as a method to provide up-to-dateness information for the S-100 based products

The “ENC Update Status Report” from the IHO S-63 is a good example for to provide the machine managed method. The “PRODUCTS.TXT” published by RENC and include into every delivery set covers everything from the RENC. The “PRODUCTS.TXT” can be provided as “FULL” and “PARTIAL”. Each “PRODUCTS:TXT” include issue date – this is the issue date for the up to dateness information provided by the “PRODUCTS.TXT”. These details means that it is possible to provide subsets of up to dateness information and the merging of such information is a responsibility of the receiver i.e., the ECDIS onboard. Further the ECDIS onboard is required to declare all cells for which the up to dateness information from the “PRODUCTS.TXT” is too old as “not up to date”.

The S-63 provided

1. Common issue date for the included up to dateness information
2. A flag if the information provided is “FULL” (i.e., covers all available from the source) or “PARTIAL”
3. Per cell newest edition number, update number and issue date

It is assumed that the intention is that the S-128 will provide up to dateness for S-10X based products. Obviously, the encoding of the S-128 should follow principles below:

1. Subdivision per S-10X product available from the source. For example, S-101, S-102, etc.
2. Within each subdivision
	1. Common issue date for the included up to dateness information
	2. A flag if the information provided is “FULL” (i.e., covers all available from the source) or “PARTIAL”
	3. Per cell
		1. if the S-10X product specification include concept of incremental updates:

Newest edition number, update number and issue date

* + 1. if the S-10X product specification include concept of new editions only:

Newest edition number and issue date

Model for the worldwide provision of up to dateness

The distribution of up to dateness information using the S-128 could be centralized or non-centralized.

Centralized means that a single S-128 including “FULL” flag would provide up-to-dateness information from all sources of covered S-10x products. The “PARTIAL” flag version would a subset of this full world view. The pro of the centralized solution is that the onboard ECDIS could simply replace the previously loaded S-128 by the new. The con would be the difficulties to established such a centralized system.

Non-centralized means that an onboard ECDIS should even treat a “FULL” flagged S-128 as being “FULL” for just one source from which the ECDIS is able to receive delivery sets of S-10X products. But this treatment is similar as treatment of “PARTIAL” flagged versions. Therefore, implementation of non-centralized system for S-128 based up-to-dateness would not be more complex for an onboard ECDIS.

For the sources the non-centralized system would be more manageable. If a source contains only, for example, S-124 related data sets then the S-128 from that source could include only one subdivision named S-124. On the other hand, an overarching RENC service providing everything for a geographic area could include subdivisions for all IMO SOLAS requirement related S—10X products.

## Conclusions

The provision of S-10X products needs a machine manageable method to handle up to dateness. S-63 can be used as a mature example how to build such a method. S-128 needs just to add the fact that there are more products than S-57 ENC charts.

## Recommendations

Use information of this paper for completion of the drafting of the S-128. The non-centralized model is recommended for the worldwide provision of the up to dateness.

## Action Required of NIPWG

The NIPWG8 is invited to:

a. Note and discuss this paper

b. Review the drafted S-128 PS Package against the information provided by this paper and amend the draft S-128 PS Package, if appropriate