

Transition to S-101 ENC's in ECDIS

October 2020

Position summary

CIRM members foresee many benefits to the mariner through the incorporation of data products from the S-100 series into navigational equipment, and CIRM supports the transition to S-101 ENC's in ECDIS.

However, the start date and duration of the associated “transition period” need to be carefully evaluated prior to being adopted by IMO, and due consideration needs to be given to the idea that manufacturers will have to seamlessly support both S-57 and S-101 ENC's (“dual-fuel mode”) for the unknown duration of a transition period. Furthermore, the goal of IMO in revising the ECDIS performance standards (MSC.232(82)) should be to expand the scope of ECDIS type approval to facilitate the integration of selected S-100 overlays/datasets in support of e-navigation.

Background

Development of S-101

The International Hydrographic Organization (IHO) maintains ECDIS standard S-57, the transfer standard for digital hydrographic content. S-57 has been used for official Electronic Navigational Charts (ENC's) since November 1995.

IHO's S-100 Universal Hydrographic Data Model was adopted by the IMO in 2011 as the basis for technical harmonization of data services providing navigation-related information exchange. Following maturation of the S-100 framework, the IHO has released its new transfer standard, S-101 (*Electronic navigational chart product specification*), now at version 1.0.0, with the stated intent that S-101 ENC's will eventually replace S-57 ENC's.

IHO's proposed roadmap for the introduction of S-101 ENC's in ECDIS

As stated in paper NCSR 7/22/5, IHO's view is that by 2024, S-101 ENC's will be in regular production, distributed by the established dissemination network in partnership with commercial chart suppliers, and that substantive geographic coverage will have been achieved. IHO is focusing on 2024 to synchronise with the implementation of IMO Circular MSC.1/Circ.1609 (*Guidelines for the standardization of user interface design for navigation equipment*) which will come into force for new ECDIS equipment on 1 January 2024.

In NCSR 7/22/5 IHO also states that identical coverage will be provided for S-57 ENC's and S-101 ENC's for a “transition period” until all ECDIS in operation have become S-101 compatible (which IHO expects to be achieved by 2030). Therefore, IHO is of the view that “new ECDIS systems to be brought

into the market at the time when S-101 ENC coverage starts (2024) will have to be capable to process both transfer standard formats: S57 ENC's and S-101 ENC's."

Furthermore, NCSR 7/22/5 states that, *"From the user's perspective, presentation of cartographic and functional features to meet the IMO mandated content in a mixed environment of S-57 ENC's and S-101 ENC's in one ECDIS device will be seamless and presented under the identical presentation regime for charted features and navigational objects."*

Amendments to ECDIS Performance Standards to introduce S-101 ENC's

IMO's Maritime Safety Committee has been invited, by its NCSR Sub-Committee, to agree to the expansion and renaming of output No.164 on *Revision of ECDIS Guidance for good practice (MSC.1/Circ.1503/Rev.1)* to include also the preparation of amendments to ECDIS performance standards (resolution MSC.232(82)) to include references to S-98, S-100 and S-101, in order to make S-101 ENC compatibility legally binding for future ECDIS.

If approved by MSC 102 (4-11 November 2020), the work to amend MSC.232(82) will begin at NCSR 8 (January 2021). IHO has informed IMO of its intention to submit a proposed amendment to MSC.232(82) to the NCSR 8 meeting.

Discussion on the transition to S-101 ENC's in ECDIS

S-101 transition period

In the context of the introduction of S-101 ENC's in ECDIS, "transition period" refers to the duration of time during which ECDIS systems move from support for S-57 ENC's to support for S-101 ENC's.

Start date of transition period

Regarding the IHO's suggestion (NCSR 7/22/5) that it should be *"legally binding"* for new ECDIS to support S-101 ENC's from 1 January 2024, CIRM is of the view that neither the S-100 framework nor the S-101 standard and the associated type approval arrangements are at a sufficient level of maturity that would enable ECDIS to support S-101 ENC's by 1 January 2024.

Neither have CIRM members identified any technical reason why the start of the transition period needs to be synchronised with the implementation date of MSC.1/Circ.1609 (i.e. 1 Jan 2024).

Furthermore, CIRM understands that some IHO Member States have expressed doubt that S-101 ENC's will be in regular production by 2024.

The proposed date of 1 January 2024 seems even more unrealistic when we consider that the IMO's ECDIS Performance Standards (MSC.232(82)) and, in turn, the IEC's ECDIS testing standard (IEC 61174) will have to be revised before ECDIS can legally support S-101 ENC's. In each case there will be a lengthy timeline associated with the revision; CIRM members estimate that it will take a minimum of three years just to revise IEC 61174. Following the revision of IEC 61174, manufacturers will require additional time (often in the order of years) to develop and type approve systems compliant with the revised standard.

When determining the start and duration of the S-101 transition period, CIRM is of the view that lessons must be learned from the IHO's 2015 revision of ECDIS standards (S-52, S-52 Annex A Presentation Library, S-64). The lack of time that was made available to manufacturers and their

customers to develop and undertake the consequential ECDIS upgrades caused a significant amount of industry upheaval, and necessitated international regulatory action to extend the original transition period by 12 months.

End date of transition period

Paper NCSR 7/22/5 (IHO) suggests that for the duration of the transition period, manufacturers will be required to support both S-57 and S-101 ENC's in their ECDIS systems (this has been referred to as "dual-fuel mode"). Such dual support would incur additional cost through increased type approval burden, and so CIRM is therefore of the opinion that, if manufacturers are required to provide dual-fuel mode during the transition period, the duration of the transition period must be limited.

CIRM's proposal – transition period with phased start date and definite end date

CIRM's view is that specifying a phased start date and definite end date would be a practical approach by IMO to the S-101 transition period.

The phased start to the transition period would make it mandatory for manufacturers to support S-101 ENC's by a realistic future date (for example, on/after 1 January 2029), and, in the interim period (for example, on/after 1 January 2025, before 1 Jan 2029), permit manufacturers to introduce an S-101-compliant ECDIS earlier if they were able to do so.

With a mandatory compliance date of 1 January 2029, this phased approach would provide ample time for the completion of the necessary standardisation work associated with the introduction of S-101 ENC's in ECDIS (IHO, IMO and IEC standards), as well as the subsequent safe and controlled development and type approval of new ECDIS systems. At the same time, any manufacturer able to do so would be permitted to introduce an S-101-compliant ECDIS earlier than the mandatory compliance date.

Regarding the duration of the transition period, CIRM's view is that in order to minimise the cost burden on manufacturers incurred by support for dual-fuel mode in ECDIS, and to incentivise the wider global implementation of S-101, IMO should specify a realistic end date for the S-101 transition period, by which date all ECDIS should only be required to support S-101 ENC's.

Amendments to IMO's ECDIS performance standards - Resolution MSC.232(82)

The provisional amendments to MSC.232(82) suggested by IHO during the NCSR 7 meeting in January 2020 (by way of J-Paper) propose minor changes that would introduce references to S-98, S-100 and S-101, in order to make S-101 ENC compatibility legally binding for future ECDIS.

Benefits of moving to S-100 ECDIS

In CIRM's view, the main driver behind moving to an S-100-compliant ECDIS is not just the ability to use S-101 ENC's, because in a practical sense they will offer nothing new to the user, but is rather the possibilities associated with the integration of the datasets/overlays provided through the other S-100 product specifications that are under development (e.g. "S-102 - Bathymetric Surface").

CIRM's proposal – expand the scope of ECDIS Type Approval through broader revision of MSC.232(82)

CIRM's view is that the goal of IMO in revising the ECDIS performance standards should be to expand the scope of ECDIS type approval to facilitate integration of selected S-100 overlays/datasets to support e-navigation (for example, S-102 Bathymetric Surface, S-104 Water Level Information for

Surface Navigation, S-111 Surface Currents, S-124 Navigational Warnings, S-129 Under Keel Clearance Management, S-411 Sea Ice Information and S-4xx Weather Overlays) by making the necessary changes to MSC.232(82), and thereby realise the full potential of S-100 ECDIS. These changes to MSC.232(82) would go further than simply introducing references to S-98, S-100 and S-101, as suggested by the IHO during NCSR 7.

CIRM position on the transition to S-101 ENC's in ECDIS

CIRM holds the following positions:

- Specifying a **phased start date** and **definite end date** would be a practical approach by IMO to the S-101 transition period. The phased start to the transition period would make it mandatory for manufacturers to support S-101 ENC's by a realistic future date (for example, **on/after 1 January 2029**), and, in the interim period (**on/after 1 January 2025, before 1 Jan 2029**), permit manufacturers to introduce an S-101-compliant ECDIS earlier, if they were able to do so.
- Regarding the **duration of the S-101 transition period**, if manufacturers are required to support both S-57 and S-101 ENC's in ECDIS during the transition period, in order to minimise the cost burden on manufacturers incurred by support for "dual-fuel mode" and to incentivise the wider global implementation of S-101, IMO should specify a **realistic end date** for the S-101 transition period, by which date all ECDIS should only be required to support S-101 ENC's. CIRM's view is that it should be no more than four years from the date of mandatory support for S-101 (for example, **1 Jan 2033**), but of course the precise date needs to be discussed thoroughly between all stakeholders before being agreed upon.
- Regarding the upcoming amendments to Resolution MSC.232(82), the goal of IMO in revising the ECDIS performance standards should be to **expand the scope of ECDIS type approval to facilitate the integration of selected S-100 overlays/datasets in support of e-navigation** by making the necessary changes to MSC.232(82), and thereby realise the full potential of S-100 ECDIS. These changes to MSC.232(82) would go further than simply introducing references to S-98, S-100 and S-101, as suggested by the IHO during NCSR 7.

