



Report on liaison with ENCWG

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IHO ENCWG

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About CIRM

- **International association of marine electronics companies**
- **NGO in Consultative Status to IMO; Observer of IHO**
- **Approx.105 members, including:**
 - **Equipment manufacturers**
 - **Service providers**
 - **System integrators**
 - **ECDIS companies – manufacturers, kernel makers, data providers (UKHO, NOAA)**

Topics

- 1. S-63 vulnerability**
- 2. CIRM position on transition from S-57 to S-101 ENC's**
- 3. CIRM Workshop on S-100 and the future of ECDIS**
- 4. Future collaboration between CIRM and IHO**



S-63 cyber security vulnerability

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S-63 vulnerability: discussion

- **IHO S-63 Stakeholder Survey circulated November 2020, comprising:**
 - **Description of proposed technical solution**
 - **Test dataset**
 - **Impact assessment questionnaire**
- **Considered by CIRM ECDIS Working Group, comprising OEMs, kernel makers, data providers (100+ individuals)**

S-63 vulnerability: position summary

- **CIRM developed position paper and shared with ENCWG Chair**
- **Position summary:**

CIRM acknowledges that the presence of unsigned files in the current ENC exchange set is a weakness which should be addressed. However, CIRM is of the view that the relatively low-probability risk could be borne by the shipping industry in the short-term, and if necessary mitigated through use of ship-based procedures and tools, until a full technical solution can be implemented as part of the wider implementation of S-100 ECDIS.



Comité International Radio-Maritime
International association for marine electronics

Position Paper

Addressing the S-63 vulnerability

March 2021

Position summary

CIRM acknowledges that the presence of unsigned files in the current ENC exchange set is a weakness which should be addressed. However, CIRM is of the view that the relatively low-probability risk could be borne by the shipping industry in the short-term, and if necessary mitigated through use of ship-based procedures and tools, until a full technical solution can be implemented as part of the wider implementation of S-100 ECDIS.

IHO S-63 cyber security vulnerability

The IHO S-63 standard (*IHO Data Protection Scheme*) was developed for encrypting, securing and compressing electronic navigational chart (ENC) data. S-63 was first released in December 2002 and is currently on edition 1.2.

There are several files within an IHO S-63 edition 1.2 encrypted ENC exchange set that do not currently carry digital signatures for the purpose of authentication by data clients. The lack of authentication on these files is acknowledged as a weakness in the ENC supply chain which has the potential to be exploited.

In its ongoing consideration of the matter, the CIRM ECDIS Working Group has taken the view that in order to determine the best way forward, an impact assessment should be undertaken to evaluate the cost and impact of addressing the S-63 cyber vulnerability against doing nothing and accepting the risk.

IHO S-63 Stakeholder Survey – impact assessment on proposed solution

In November 2020, the IHO ENC Standards Maintenance Working Group (ENCWG) circulated an IHO

S-63 vulnerability: detailed position

- **To minimise cost and disruption, it is preferable not to introduce the proposed S-63 solution as a separate implementation**
- **S-101 ENCs will not be subject to the S-63 vulnerability, so there is a long-term solution in place**
- **Implementation of the solution could be better achieved by scheduling its ECDIS component as part of the implementation of Dual-Fuel ECDIS**
- **Regarding the interim risk to existing ECDIS, procedures and/or checking tools could be adopted by shipping companies/bridge teams in order to manage the risk**



**CIRM position on transition from
S-57 to S-101 ENC's**



Transition to S-101 ENC_s

- **CIRM fully supports the move to S-100 ECDIS and transition to S-101 ENC_s**
- **CIRM's core positions:**
 - **Any implementation date(s) must be realistic and practical**
 - **An end date is needed for the transition period, after which ECDIS need only support S-101 ENC_s**
 - **Amendments to MSC.232(82) should include words to facilitate integration of S-100 datasets in support of e-navigation**

CIRM Comité International Radio-Maritime
International association for marine electronics

Position Paper

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 (ENCs) since November 1991.

IHO's S-100 Universal Hydrographic Data Model was adopted by the IMO in 2011 as the basis for



CIRM Workshop on S-100 and the future of ECDIS



CIRM Workshop on S-100: Overview

- **CIRM held a two-day virtual workshop in April 2021**
- **Purpose: bring together CIRM Members and external stakeholders to discuss in depth all aspects of the introduction of support for S-100 in ECDIS**
- **Approx. 70 participants comprising CIRM members and guests (IHO, RENCs, HOs, etc)**

CIRM Virtual Workshop

S-100 and the future of ECDIS

CIRM Workshop on S-100: session themes

1. Overview and progress of S-100 standards (Mod: Julia Powell)
2. What will the S-100 ECDIS look like? (Mod: Tom Mellor)
3. Dual-Fuel ECDIS (Mod: Jonathan Pritchard)
4. Standardisation work needed to realise S-100 ECDIS (Mod: Hannu Peiponen)

CIRM Virtual Workshop

S-100 and the future of ECDIS

CIRM Workshop on S-100: discussion points

- **Timescales associated with S-101 ENC coverage and use in ECDIS**
- **Nature and scope of changes to standards including MSC.232(82) and IEC 61174**
- **Dynamic adjustment of chart data using non-ENC product specifications**
- **Impact of S-100 on user training, ECDIS hardware and data usage**
- **Definition of SENC & role of SENC Delivery in S-100 ECDIS**
- **Capabilities of dual-fuel ECDIS; possibility of encountering S-101 “anomalies”**
- ***ETC!***

CIRM Virtual Workshop

S-100 and the future of ECDIS

CIRM Workshop on S-100: outcomes

- **Workshop report is under development**
- **Some key conclusions:**
 - **Significant amount of standardisation work needed to realise full S-100 ECDIS**
 - **S-98 and S-164 timelines key to successful transition**
 - **CIRM should contribute to IHO's work to define DF-ECDIS**
 - **DF-ECDIS will be a fully-featured S-100 ECDIS (i.e. not an interim step)**
- **IEC should begin preparation to revise IEC 61174 without delay**

CIRM Virtual Workshop

S-100 and the future of ECDIS



Future collaboration between CIRM and IHO



Future collaboration between CIRM and IHO

- **CIRM has encouraged its members to directly participate in IHO's technical work**
- **CIRM will continue to support IHO and its working groups where appropriate**
- **Specifically, CIRM will support IHO's work to:**
 - **Prepare draft amendment to MSC.232(82) *ECDIS Performance Standards***
 - **Prepare draft amendments to MSC.1/Circ.1503/Rev.1 *ECDIS Guidance for Good Practice***
 - **Define the Dual-Fuel ECDIS concept**



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Thank you