Paper for Consideration by HSSC

S-100 Implementation and Validation

Submitted by:	UK
Executive Summary:	This paper seeks to present considerations for discussion as Phase 1 S-100 Specifications enter implementation and validation. It presents inputs on how the IHO could approach this and manage associated risks building on the work to date of the ISO 9001 cell.
Related Documents:	Phase 1 S-100 Product Specifications S-98 S-164 Application and Usability of ECDIS Safety Study ISO 9241-210-2019 Human-centred design for interactive systems
Related Projects:	S-100

Introduction / Background

1.   With the operational versions of the phase 1 S-100 product specifications moving towards Implementation[1] the UK would like to raise some points for HSSC discussion as we enter a period of testing and validation. Noting the work of the ISO 9001 cell we see a need to continue to adopt a risk management approach to the implementation and validation phase. This paper seeks to set out some of the risks that we see for discussion and explores potential mechanisms to mitigate and manage these risks. There is also a need to track progress of implementation and validation in a structured way so an understanding of confidence in the standards in achieving the desired outcome can be achieved.

2.   S-100 ECDIS introduces a new level of complexity through the integration of multiple data layers. Evidence from experience with S-57 ECDIS such as the UK/DK MAIB ECDIS Safety Study emphasise the challenges of introducing such technology. For S-100 ECDIS to achieve the envisaged benefits it is therefore important that this complexity is managed so that the user experience is enhanced when compared to S-57 ECDIS systems.

Analysis/Discussion

3.   To date the focus has been on the development and finalisation of standards through the HSSC. Although trials and testbeds are starting to emerge active testing including end users is yet to begin. In order to effectively validate the end user experience of S-100 ECDIS the UK advocates a user centred design approach reflecting direction from the IMO regarding Human Centred Design. We note that the original intent of the S-100 Test Strategy Meeting was to coordinate a structured approach to testing but in practice it has focussed primarily on processing changes to the S-100 standard. It is also noted that achieving the requirements set within the IMO Performance Standard requires a joined-up approach across various standards and product specifications. Due to the technical nature of the standards and component catalogues there is a need to achieve a high degree of clarity of the intended goals. Annex A of this paper includes some very outline ideas on how Implementation and Testing & Validation could be structured to support these goals.

4.   Data Quality is a clear example of where the IHO through the Data Quality Working Group has applied the relevant ISO 191xx standards to ensure that data conforms to the specifications. This has required significant work and must be commended. But limited focus has been placed on how an integrated stack of S-10x datasets provide data quality from an end user perspective. Increasingly as developments such as voyage optimisation emerge vessels are transiting in areas where the data quality is lower and a number if incidents and have evidenced this.

Footnote 1 - Within this paper implementation is intended to mean the creation of S-10x ECDIS and S-10x datasets based on the published standards. Validation is intended to mean verification that the resulting systems and data meet the user need and the requirements set out in the IMO Performance Standard as intended.

5. The UK would like to offer the following points as inputs for consideration.

a) Develop and document a collection of user requirements using an appropriate structure such as [user stories](). These should be related to associated tests in S-164 and requirements in IEC 61174 as it is developed.

b) Seek to collate results from testbeds and trials to build a body of evidence that can then support stakeholders in the adoption of S-100 ECDIS.

c) Continue the work of the ISO 9001 cell and take a risk-based approach to S-100 Implementation.

Conclusions

We are entering a critical stage for S-100 where the testing and validation conducted will be pivotal in determining the market adoption and uptake. Clarity on how S-100 meets user needs is needed and the risks of implementation need effective management. The ISO 9001 cell should continue to support this activity taking a risk-based approach.

Recommendations

This paper recommends that HSSC considers the points raised in this paper in support of S-100 Implementation and Validation.

Justificaᴛion and Impacts

The successful implementation of S-100 ECDIS has been identified as a critical priority for the IHO. The impact of extending the work of the ISO 9001 cell is considered limited. The development of user requirements and collation of results is a significant task but is considered a major risk mitigation measure.

The HSSC is invited to:

a) Consider the need for a continued risk-based approach building on the work of the ISO 9001 cell as S-100 Phase 1 specifications are implemented

b) Consider the need to develop and document user requirements so that testing results can be captured in a consistent way in order to support successful implementation and validation of S-100 ECDIS

Annex A – Overview Diagrams

S-100 ECDIS Implementation Overview
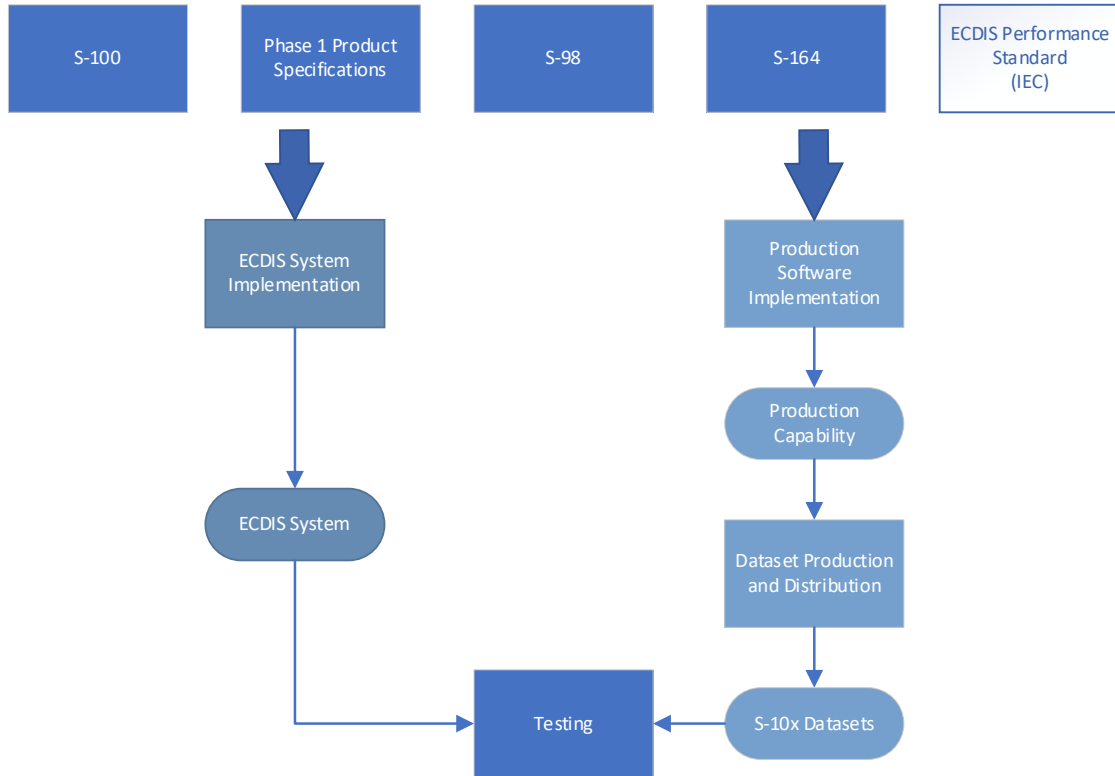
S-100 ECDIS Testing & Validation Overview