Paper for Consideration by the HSSC-13

IEC Activities affecting HSSC

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Executive Summary:	This paper explains status of IHO related issues within IEC Technical Committee 80 (TC80).
Related Documents:	HSSC12_2020_07.4A_EN_IEC_Activities_affecting_HSSC
Related Projects:	N/A

Introduction of S-101 or S-100 into IEC 61174 ECDIS standard

Introduction / Background / Analysis / Discussion

1. In the IEC TC80/Plenary October 2019 meeting IHO informed IEC TC80 about the IHO plan to introduce S-101 ENC charts as alternative for S-57 ENC charts for mandatory implementation by ECDIS with in-force date set as 1st Jan 2024. The IEC TC80/Plenary meeting discussed on the topic and felt that the issue was not mature enough in 2019 for decision making and set a task to secretariat of IEC TC80 ask again opinion of the National Committees of IEC TC80 in year 2020.

2. The role of the IEC TC80 in the IMO rule ecosystem is to provide technical testing standard for compliance with IMO Performance Standards related to navigation and radio communication. Often IMO sets a rule based on functionality available to operator and the related IEC standard describes the minimum technical facilities to implement the specified functionality. Sometimes IMO sets a rule including details of technical implementation.

Current 4th edition of the IEC 61174 ECDIS standard is a result of evolution. For some parts, for example the technical transfer format for Route plans, IEC has drafted and implemented all details based on short and simple functional requirement of IMO to require that the backup arrangement should automatically continue route monitoring in case that primary ECDIS is no more available.

An example from the other side is how the implementation of the IHO S-57 ENC charts is treated. The IEC 61174 standard relies 100% on the content of the IHO S-64 Test data sets for ECDIS, see extract below

> 6.5   Requirements related to ENC chart
> 6.5.1   General
> The IHO S-64 test data sets for ECDIS contain a series of tests, associated test data and updates in encrypted and unencrypted forms. All required data sets and graphic plots are included in the IHO S-64 along with an instruction manual which details each test and specifies the required results.
> All tests specified as mandatory within IHO S-64 shall be carried out to verify conformance with the requirements of this standard in accordance with IHO S-64. Other tests specified as optional within IHO S-64 shall be carried out if the EUT has the specified capability as described in IHO S-64.
> IHO S-64 specifies which of the tests are not applicable for SENC delivery and which of the tests require alternatives specific for SENC delivery.
> 6.5.2   Presentation library
> Verified by conformance to 6.5.1.
> 6.5.3   ENC
> Verified by conformance to 6.5.1.
> 6.5.4   Encrypted ENC
> Verified by conformance to 6.5.1.
> 6.6   Accuracy
> Verified by conformance to 6.5.1.

3. IEC has noted that the IHO S-100WG had on 6th January 2021 a virtual kick-off meeting to develop S-164, a new standard to provide similar test data sets and test instructions for S-100 concept as the S-64 has provided for S-57 ENC charts environment.

The adding of S-101 or S-100 concept into the IEC 61174 could be as simple as replacing "S-64" as "S-164" or "S-64 and S-164" depending of requiring of dual-fuel or single fuel in the above extract from IEC 61174.

4. Since the IEC TC80/Plenary October 2019 meeting the plan of the secretariat of IEC TC80 has been to ask opinion of the National Committees after IMO has made a decision how to proceed with the IHO initiative to introduce the dual fuel S-57 & S-101 ECDIS. IHO raised the issue in IMO NCSR-7 January 2020 and it was assumed that IMO MSC-102 May 2020 would make decisions based on IHO initiative. However, the Covid-19 pandemic re-scheduled the May 2020 meeting of IMO MSC-102 as a short virtual meeting of the most urgent issues and there is not yet any clear vision if the time schedule of in-force date set as 1st Jan 2024 proposed by IHO to IMO will be the IMO decision or if the time schedule will be amended. As result IEC TC80 has not yet asked opinion of the National Committees.

5. For your information the normal timetable for the development of a new edition of an IEC standard is 2 years of committee work to draft the Committee Draft for Vote (CDV) plus 1 year of voting & comment process to complete the draft as International Standard. It should be noted that all technical details referenced by the draft for an IEC standard should be completed before the IEC workgroup completes the CDV. This means that S-101 related IHO standards including both the specification and testing part should be published as final versions before the assumed completion of the CDV.
Another point to note is that on the day of publishing a New work item Proposal (NP) or Questionnaire (Q) for vote by the National Committees of the IEC TC80, the proposed topic should be mature enough for the National Committees to understand that now it is the time to create the new edition of the IEC 61174 ECDIS.

6. The role of IEC TC80 is to provide standards to be available for the user community. IEC TC80 itself has no opinion on how much time the user community needs to be ready to use a newly published IEC standard.

Action Required of HSSC
7. The HSSC is invited to:
1. Note that IEC follows the progress about introduction of S-101 or S-100 into IMO requirements for ECDIS

Data cyber security requirements for navigation equipment (IEC 63154)

Introduction / Background / Analysis / Discussion
8. The IEC standard requesting authentication of all external data files at import into a navigation equipment is IEC 63154. The work on this standard begun in 2017 and the new standard was published in March 2021.

9. IEC raised this issue of cyber security for the first time at HSSC-10, May 2018. The background information and analysis are still the same as the years before. Also, the conclusion of IEC – the authentication of data from IHO sources should be overarching i.e. including all auxiliary files. See HSSC10-07.4A_IEC_Activities_affecting_HSSC_2018.

10. IEC has noted progress by IHO
   • For S-57 ENC charts IEC has noted that work is still going on by IHO ENCWG. The issue has been discussed at ENCWG meetings 2018, 2019 and in virtual meeting 2020 and 2021. Meetings have drafted a solution for the issue (i.e. new edition of S-63) and IEC has noted that IHO ENCWG has been in a process to seek approval of the stakeholders for the solution. IEC understands that international organizations need time to develop and agree standards. Therefore, currently IEC is pleased to follow up the progress by IHO ENCWG.

Action Required of HSSC
11. The HSSC is invited to:
1. Note that IEC follows the progress about the solution (new edition of S-63) for S-57 ENC charts

S-421: Route Plan based on S-100 (IEC 63173-1)

Introduction / Background / Analysis / Discussion

12. IEC TC80 has established WG17 to address CMDS (Common Maritime Data Structure). The workgroup was created in October 2015. Convenor is Dr. Kwangil Lee (KMOU, Korea). Within IEC TC80 all CMDS works related with shipborne system will be handled in this workgroup. IEC TC80 applied and was granted S-100 domain ownership in December 2016.

13. Under progress is **S-421 Route Plan Exchange** (also known as **IEC 63173-1**). The base is already published Route Exchange, IEC 61174 Ed4 ECDIS, Annex S, extended by ideas from Testbeds, especially STM validation and SMART navigation. Timeline is:

- The related workgroup completed drafting of the Committee Draft for Voting (CDV) and the commenting by National Committees begun in October 2020
- The commenting of the CDV closed on 1st Jan 2021
- The Final Draft International Standard (FDIS) is under preparation and it is expected to be available for voting by National Committees in April 2021
- The publication of IEC 63173-1 is forecasted around September 2021

14. The object model of the **S-421 Route Plan Exchange** reflects the needs of the use cases:
1. Route cross check: Ship sends route for check by shore, for example by VTS
2. Flow management: Shore, for example VTS, organize the schedules of ships for fluent sailing
3. Enhanced monitoring: Shore monitor sailing of the ship against the route plan
4. Ice navigation: Traffic management for ice covered areas provides routes for ships
5. Under keel clearance management: This operates together with S-129
6. Fleet route planning: A tool for shipowner to manage fleet
7. Chart management: Chart seller provide charts based on the route plan
8. Route optimization: Ship uses 3rd party service to optimize route plan
9. Port call synchronization: Ship participate in port call optimization or just in time arrival scheme
10. Reference route: Shore provide reference route to sail for example from a pilot point to port
11. Search and rescue: MRCC instruct ships about SAR sailing patterns

15. IEC has noted that Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and EC have submitted an INF paper (MSC 103-INF.12) to IMO MSC 103. The INF paper informs that these countries plan to submit a new work item proposal to IMO MSC 104 to amend the IMO ECDIS Performance Standard MSC.232(82) to include implementation of the IEC 63173-1 as a standardized format to exchange route plans for supporting following Maritime services listed in IMO e-Navigation: VTS Information Service (INS), VTS Navigational Assistance Service (NAS), Traffic Organization Service (TOS), Port Support Service (PSS), Maritime Safety Information Service (MSI), Pilotage Service, Tug Service, Vessel Shore Reporting, Ice Navigation Service, Meteorological Information Service and Search and Rescue Service (SAR).

Action Required of HSSC

16. The HSSC is invited to:
1. Note the information provided

Secure exchange and communication of S-100 based products (SECOM) (IEC 63173-2)

Introduction / Background

17. The background of the SECOM is the e-Navigation testbed "STM validation project" which tested e-Navigation related file transfers using SOA (Service Oriented Architecture) principles with about 400 real ships and multiple VTS/Ports. The project team within the IEC TC80/WG17 was created in April 2019. Project leader is Björn Andreasson (Swedish Maritime Administration, Sweden).

18. The IEC 63173-2 standard is intended to be a gap-filler to provide standardized communication infrastructure between shore and ships for bi-directional transfer of files related to the e-Navigation. It is assumed that majority of such files may be based on IHO S-100 although the SECOM infrastructure is in principle capable to transfer any anonymous data file. Excluded from SECOM is services which need data streaming and which cannot be converted as a series of big or small separate data files. Technical details are available in the year 2020 report of IEC to HSSC (HSSC12_2020_07.4A_EN_IEC_Activities_affecting_HSSC).

19. Latest version available is a Committee Draft (CD), IEC TC80/987/CD, published on 8th Jan 2021 and closed for comments on 5th Mar 2021. The Committee Draft for Vote (CDV) is planned for 3rd half of 2021.

20. The planned publication as international standard is 2nd half of 2022.

21. IEC has noted that Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and EC have submitted an INF paper (MSC 103-INF.12) to IMO MSC 103. The INF paper informs that these countries plan to submit a new work item proposal to IMO MSC 104 to amend the IMO ECDIS Performance Standard MSC.232(82) to include implementation of the IEC 63173-2 to facilitate secure shore-ship, ship-shore transfer of digital information related to maritime services as specified by the IMO e-navigation.

Action Required of HSSC
22. The HSSC is invited to:
    1.   Note the information provided