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Agenda item 5

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APPLICATION OF SINGLE-WINDOW CONCEPT

A Study of Ship to Shore Information Exchange for Efficient Electronic Port Clearance

Submitted by the Republic of Korea

SUMMARY

Executive summary: This document provides information on progress on the technical standardization of maritime digital communication technology and on the future standardization plan to digitalize ship to shore information exchange, to facilitate the ships' port clearance process

Strategic direction: 8

High-level action: 8.0.3

Output: 8.0.3.2

Action to be taken: Paragraph 24

Related documents: FAL 38/INF.2; FAL.2/Circ.127; FAL 39/INF.2, FAL 39/INF.5; FAL 40/INF.7; MSC 96/INF.10 and MSC 96/25

Background

1 The Republic of Korea informed FAL 38 (FAL 38/INF.2) of the Ship Ad-hoc Network Technology (SANET), its needs and features.

2 FAL 39 noted the additional information provided by the Republic of Korea (FAL 39/INF.5) in respect of the research into enhancing the efficiency of maritime logistics using digital very high frequency (VHF) radio system technology, including the development of maritime VHF digital communication technology, and the test results and progress of SANET.

3 FAL 40 noted the information provided by the Republic of Korea (FAL 40/INF.7) on progress on the technical standardization of maritime communication technology and the needs for digitalization of ship information and integration with port information systems.

4 MSC 96 noted with appreciation the information contained in document MSC 96/INF.10 (IALA) on the progress made in the development of the VHF Data Exchange System (VDES), and considered the outcome of the World Radiocommunication Conference 2015 (WRC-15).

5 This document takes into consideration different international standards to facilitate the process of clearance of ships at port, and intends further to establish a basis for integrating port information using the maritime digital communication system.

Technical standardization progress

6 The VDES is a digital communication system for digitalized data exchange in VHF channels, including terrestrial VHF Data Exchange (VDE), satellite VDE, Application Specific Messages (ASM) and Automatic Identification System (AIS) functions. The e-navigation strategy of IMO suggests a transition from analogue to digital audio communication systems and the development and technical standardization of the VDES are actively being discussed by many international organizations. It is important to establish relevant services and systems to achieve efficient ship-to-shore information exchange, utilizing the future VDES technology.

7 WRC-15 decided to allocate 156.0125-157.4375 MHz and 160.6125-162.0375 MHz frequency bands in order to implement the VDES technology and is now working on the mandatory regulations. There are a number of recommendations and reports regarding the VDES, including ITU-R M.2092 on technical characteristics, ITU-R M.2371 on channel arrangement and ITU-R M.2372 on interference analysis.

8 ITU-R Study Group 5 plans to produce a report by May 2018 on the technical characteristics and compatibility of the VDES. IALA has proposed in November 2016 two options for the frequency bands used for the satellite VDE: the first option, to use identical channels for both terrestrial and satellite VDE in order to reduce the complexity of the system and the second option, to use separate channels to eliminate interference. No decision has been adopted yet.

Standardization plan



9 IMO adopted the S-100 standard developed by IHO as a baseline for the development of Common Maritime Data Structure (CMD5) for e-navigation. The S-100 standard is a Geographic Information System (GIS) data oriented information model and the development of more extensive data model is required. In particular, there is a clear need to maintain the compatibility with existing standards, such as the standards IEC 61162 and ISO 28005.

10 FAL 39 considered document FAL 39/INF.2 (ISO) and noted the technological solutions available to implement electronic certificates for ships, which showed that the required technology was readily available, and therefore that electronic certificates were a viable possibility. For technical options for implementing electronic certificates, the use of international standards, especially ISO 28005, was suggested.

11 ISO 28005 contains technical specifications to facilitate efficient exchange of electronic information between ships and shore or port calls by a single window. It is intended to cover the exchange of safety and security information required under the FAL Convention and other international specifications. Also, it covers all requirements for ship-to-shore and shore-to-ship reporting procedures as defined in the FAL Convention (FAL forms 1 to 7), ISPS reporting requirements, and all ship reporting requirements referred to in resolution A.851(20). ISO 28005 is based on Extensible Mark-up Language (XML), which is a simple and flexible text format designed to be used in exchange of data on the Internet. ISO 28005 has two parts: ISO 28005-1, on message structures, and ISO 28005-2, on core data elements.

12 ISO 28005-1 defines the electronic message structure of the ship to shore information exchange in a XML Schema format. The XML Schema for ship's electronic port clearance consists of request, receipt, cancel and acknowledge processes and each message defines data elements required in each one of the four processes.

13 ISO 28005-2 defines the data elements that are entered into the data structure defined in ISO 28005-1. All data elements meet the requirements of the FAL Convention and other general reporting requirements. There are three types of data elements defined in ISO 28005-2:

- .1 the adapted XML Schema Definition (XSD) types that are basic XSD types with additional restrictions;
- .2 general data types that are the types that represent common concepts that need to be specialized to be given a context-specific meaning; and
- .3 core data types that contain a contextual meaning to a more generic concept.

14 In this regard, the Republic of Korea is currently working on defining XML based data formats to digitalize ship certificates. The message structures will be harmonized with ISO 28005-1 and ISO 28005-2 as far as possible. The digitalized ship certificates can be used to develop facilitation services for ships' entries and departures, particularly with the VDES technology.

15 Electronic interchange of information will be compulsory from April 2019, but most of the ship certificates and documents are still produced on paper. Therefore, there is a clear need to digitalize such documents in order to facilitate the procedures and to reduce administrative burdens of recognized organizations, flag States and other interested stakeholders. Fully digitalized certificates will simplify the issuance and maintenance processes and therefore will facilitate and automate a ships' port clearance process through a single window system.

16 The Republic of Korea and Norway have proposed to ISO the digitalization of certificates as a new work item. Target documents will be those detailed in the List of certificates and documents required to be carried on board ships (FAL.2/Circ.127;MEPC.1/Circ.817;MSC.1/Circ.1462), and suitable for being developed in an electronic format.

Expected outcomes

17 Commercialization and obligation of maritime digital communication systems will ensure safe navigation and facilitate shore based and coastal traffic management.

18 Provision of different maritime information services, and harmonized collection, integration, exchange and analysis of maritime information will be possible in the future.

19 Integration with GISIS, that collects, processes and provides various maritime information online, will enable efficient and expandable data transmission to ships and ports.

20 Reduction of administrative burden and facilitation of port clearance with digitalized and automated exchange of data by maritime digital communication systems.

Further considerations

21 After the development of maritime digital communication network technology, standardization and interface of the common maritime transport data model will have to be considered.

22 The data in GISIS can be used in big data analysis to ensure safe and efficient navigation and facilitation of maritime transport.

23 International Organizations such as IMO, IHO, IEC and UN/CEFACT, and Member States are encouraged to participate in this research.

Action requested of the Committee

24 The Committee is invited to note the information contained in this document and that the Republic of Korea will provide further information at FAL 42.
