INTERNATIONAL MARITIME ORGANIZATION

INTERNATIONAL HYDROGRAPHIC ORGANIZATION

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IMO/IHO HARMONIZATION GROUP ON DATA MODELLING
Agenda item 5

HGDM 1/5/5
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DEVELOPMENT OF A DEFINITION FOR MSPs AND CONSIDERATION FOR THE HARMONIZATION OF THE FORMAT AND STRUCTURE OF MSPs

Comments on documents HGDM 1/5/1 and HGDM 1/5/2

Application example of the proposed MSPs guideline structures by SMART-Navigation project

Submitted by Republic of Korea

SUMMARY	
Executive summary:	This document briefly introduces an example application of the MSP structure and guidelines as proposed in documents HGDM 1/5/1 and HGDM 1/5/2 as being implemented in the Republic of Korea by the SMART-Navigation project
Action to be taken:	Paragraph 14
Related documents:	MSC 90/27, MSC 98/20; NCSR 4/27; HGDM 1/5/1 and HGDM 1/5/2

Introduction

1 This document is submitted in accordance with paragraph 6.12.5 of the *Guidelines on the organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies* (MSC-MEPC.1/Circ.5). The document provides comments to documents HGDM 1/5/1 and HGDM 1/5/2.

2 Documents HGDM 1/5/1 and HGDM 1/5/2 (Australia *et al*.) propose a structure for MSPs and guidelines for associated technical services with reference to S-100 based product specifications.

3 In particular, these documents propose the following structure:

.1 a generic template (in HGDM 1/5/1) for describing MSPs with reference to technical services; and

.2 a generic guideline (in HGDM 1/5/2) for specifying technical services with reference to S-100 based product specifications.

4 This document provides an example of how this structure can be applied to specify and implement MSPs and technical services by a Member State. The Republic of Korea has applied this structure to the SMART-Navigation project.

5 Examples are given on specific technical services relating to specific MSPs as well as associated specific S-100 product specifications.

SMART-Navigation project

6 The SMART-Navigation project is organized and funded by the Ministry of Oceans and Fisheries of the Republic of Korea to implement e-navigation services in its waters based on IMO's e-Navigation concept adding special features: (1) services for non-SOLAS ships and (2) broadband communication using navigation-dedicated LTE networks (LTE-Maritime) for better connectivity between ship and shore.

7 The project is aiming to implement parts of MSPs 1 to 7, MSPs 10 to 12 and MSPs 14 to 15. Within these MSPs the project will implement six technical services: (1) Navigation Monitoring & Assistance Service (NAMAS), (2) Ship-borne System Monitoring Service (SBSMS), (3) Safe & Optimal Route Planning Service (SORPS), (4) Real-time Electronic Navigational Chart Distribution & Streaming Service (REDSS), (5) Pilot & Tug Assistance Service (PITAS) and (6) Maritime Environment and Safety Information Service (MESIS). Most of the services are designed for ships that pose a higher risk of having an accident or with a potential of having an enormous social, environmental or economic impact after an accident:

.1 NAMAS monitors navigation of vulnerable ships and raises an alarm as part of the navigation assistance to prevent collisions and groundings. It uses positional information of ships and their route information when available. LTE-Maritime and VDES are being considered as physical communication links for NAMAS.

.2 SBSMS monitors on-board systems of passenger ships flying the Korean flag and other ships requesting the service to detect hazardous events within the ships, such as flooding, fire and engine failure. LTE-Maritime and VDES are being considered as physical communication links for SBSMS but are not limited to these. Other communication links available on board for requesting this service can be used as well.

.3 SORPS provides safe and optimal routes plan when requested. It can be used for voyage planning of merchant ships or for emergency route guidance for small vessels which are not equipped with navigation-aid systems such as RADAR and AIS. LTE-Maritime and VDES are being considered as physical communication links for SORPS but are not limited to these. Other communication links available on board for requesting this service can be used as well.

.4 REDSS provides ENC of Korean waters for SOLAS and non-SOLAS ships when requested. It supports streaming as well for small ships which do not have on-board electronic chart system (ECS). Only LTE-Maritime is being considered as physical communication links for REDSS.

.5 PITAS supports pilotage by providing pilots and tugs with information needed for pilotage. VDES, LTE-Maritime are being considered as physical communication links for PITAS but other communication links can be used when requested by users (ships, pilot, etc.).

.6 MESIS provides maritime safety information (MSI) including navigational warning, weather information, hydrographic information and maritime environment information. LTE-Maritime and VDES are being considered as physical communication links for MESIS but are not limited to these. Other communication links available on board for requesting this service can be used as well.

System architecture of SMART-Navigation services

8 The six services of SMART-Navigation are coupled with each other via Data Distribution Service (DDS) which is a real-time message queue system to exchange information among service modules.

9 DDS and Maritime Connectivity Platform (MCP, previously known as the Maritime Cloud) are connected with each other via MCP Connector which converts S-100 data to message element and vice-versa. By using MCP Connector, SMART-Navigation service keeps compatibility with e-navigation concept while guaranteeing real-time internal data exchange among service modules.

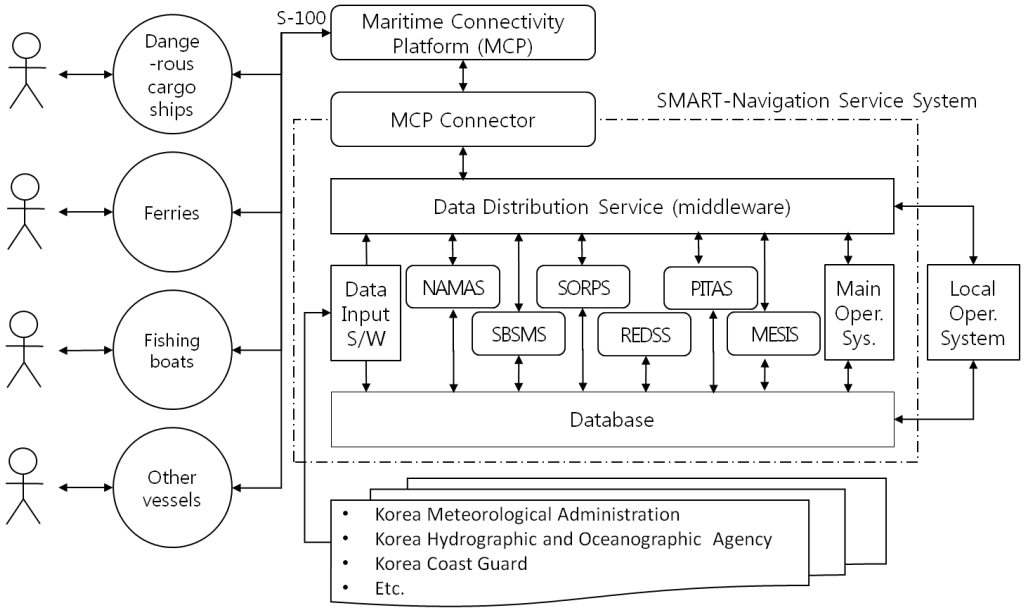

Figure 1. Overall architecture of SMART-Navigation

SMART-Navigation Services as Associated Technical Services of MSPs with reference to S-100 Data

10 As SMART-Navigation aims to provide automatic shore-based services compatible with e-navigation concept, Machine to Machine interface (M2M) is the main interaction scheme. This makes it possible for each of the six SMART-Navigation services to be regarded as an associated technical service of MSPs. The table below shows the relationship among MSPs as defined in the IMO e-navigation Strategy Implementation Plan (SIP), together with the technical services as implemented by the SMART-Navigation project and S-100 product specifications:

Maritime Service Portfolios (MSPs)		Associated e-navigation Technical Services	Related S-100 Product Specifications (interim)
MSP1	VTS Information Service (IS)	NAMAS	S-124, S-125
MSP2	Navigational Assistance Service (NAS)		S-125
MSP3	Traffic Organization Service (TOS)		S-127
MSP4	Local Port Service (LPS)	NAMAS	S-XXX (marine services, harbor infrastructure)
		MESIS	S-412
MSP5	Maritime Safety Information Service (MSI)	MESIS	S-124, S-201, S-412
MSP6	Pilotage Service	PITAS	S-XXX (marine services, harbor infrastructure)
MSP7	Tugs Service		
MSP8	Vessel Shore Reporting	N/A	N/A
MSP9	Telemedical Assistance Service (TMAS)	N/A	N/A
MSP10	Maritime Assistance	NAMAS	S-XXX (marine services)
		SBSMS	
MSP11	Nautical Chart Service	REDSS	S-101, S-102
MSP12	Nautical Publication Service	REDSS	S-101, S-201
MSP13	Ice Navigation Service	N/A	N/A
MSP14	Meteorological Information Service	MESIS	S-412
MSP15	Real-time Hydrographic and Environmental Information Service		S-104, S-111, S-112, S-201
MSP16	Search and Rescue Service	N/A	N/A

Table 1. Relationship among MSPs, S-100 Product specification and Technical services of SMART-Navigation Project

11 Due to the immaturity of S-100 product specifications, the SMART-Navigation project is developing domestic version of related product specifications using the S-100 standard for the compatibility with future international standard product specifications which will be registered on the IHO GI Registry.

12 The table is based on the current status of MSPs definition in the SIP and S-100 product specifications list. Values and Mappings in the table could vary as the definition of each MSP and product specifications mature.

Conclusion

13 This document reports on a practical application of the MSP structure and guidelines as proposed in documents HGDM 1/5/1 and HGDM 1/5/2.

Action requested of the HGDM

14 The HGDM is invited to note the information contained in this document.