INTERNATIONAL MARITIME ORGANIZATION

INTERNATIONAL HYDROGRAPHIC ORGANIZATION

E

IMO/IHO HARMONIZATION GROUP ON DATA MODELLING
1st meeting

HGDM 1/WP.1
20 October 2017
ENGLISH ONLY

DEVELOPMENT OF GUIDANCE ON THE DEFINITION AND HARMONIZATION OF THE FORMAT AND STRUCTURE OF MSPs

Report of the IMO/IHO HARMONIZATION GROUP ON DATA MODELLING to NCSR 5

1 Introduction

1.1 As instructed by the Maritime Safety Committee the IMO/IHO Harmonization Group on Data Modelling (HGDM) met from 16 to 20 October 2017 under the chairmanship of Mr. Sunbae Hong (Republic of Korea).

1.2 The group was attended by representatives from the following Member States:

AUSTRALIA
BRAZIL
CANADA
DENMARK
FRANCE
GERMANY
JAPAN
NORWAY
PERU
PHILIPPINES
POLAND
REPUBLIC OF KOREA
SWEDEN
UNITED ARAB EMIRATES
UNITED KINGDOM
UNITED STATES

1.3 The group was also attended by observers from the following intergovernmental organizations:

INTERNATIONAL HYDROGRAPHIC ORGANIZATION (IHO)
EUROPEAN COMMISSION (EC)

1.4 The meeting was also attended by observers from the following non-governmental organizations in consultative status:

INTERNATIONAL CHAMBER OF SHIPPING (ICS)
INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)
INTERNATIONAL ASSOCIATION OF MARINE AIDS TO NAVIGATION AND LIGHTHOUSE AUTHORITIES (IALA)
COMITE INTERNATIONAL RADIO-MARITIME (CIRM)

BIMCO
INTERNATIONAL MARITIME PILOTS' ASSOCIATION (IMPA)
INTERNATIONAL ASSOCIATION OF INDEPENDENT TANKER OWNERS (INTERTANKO)
INTERNATIONAL HARBOUR MASTERS' ASSOCIATION (IHMA)

2 Terms of reference

2.1 The HGDM was tasked by the Maritime Safety Committee at its ninety-eight session (MSC 98) to work only on the *Guidance on the definition and harmonization of the format and structure of Maritime Service Portfolios (MSPs)*.

3 Update on the work of IHO

3.1 The IHO representative (Mr. Anthony Pharaoh) updated the group on the latest development at IHO in respect to issues related to MSPs, primarily on the S-100 framework which provided the capacity for multiple product specifications. IHO was currently working on 19 product specifications which were at different levels of completion. IHO also established a registry which was being used for managing registers of items such as feature concepts, portrayal and product specifications.

3.2 In response to the concern raised in respect to the still unfinished work of the S-101 standard for ENC, which might also delay the completion of the IMO Guidance on MSPs, the IHO representative advised that substantial progress had been made in respect to S-101. IHO emphasized that there was not a great difference between the feature models of S-57 and S-101 and that the IHO S-100 Working Group had developed an S-57 to S-101 ENC converter which was able to convert most S-57 to S-101 feature types. As the S-100 Product Specifications would also include machine-readable feature and portrayal catalogues, update editions of the S-101 product specification would be simplified. However, the portrayal component is still presenting some difficult challenges.

4 Discussion on the overarching principles for development of the Guidance

4.1 The group discussed various overarching issues related to how to commence the work on the Guidance, including purpose, scope, the role of the Organization, the means to achieve harmonization, as well as how to balance the challenge of providing high-level guidance for the rather technical matter of harmonizing format and structure of MSPs.

4.2 The group commenced the work by considering document HGDM 1/2 (Secretariat) on Clarification on the scope and content of work of the IMO/IHO Harmonization Group on Data Modelling (HGDM), together with the related commenting document HGDM 1/2/1 (Australia et al.). The group noted both documents which clarified the overarching principles to be considered for the work on the draft Guidance.

4.3 The group confirmed the need to reference the S-100 framework within the Guidance as the baseline standard.

4.4 As instructed, the group agreed to develop a draft *IMO Guidance on the definition and harmonization of the format and structure of maritime services within the Maritime Service Portfolio (MSP)* (hereinafter referred to as 'Guidance') in the form of a draft MSC resolution without making

references to the IMO e-navigation Strategy Implementation Plan (SIP) as it was considered inappropriate to refer to a dynamic document that changed by its described outcomes.

4.5 As part of a number of presentations given at the beginning of the meeting, the Republic of Korea informed the group on the Application example of the proposed MSPs guideline structures by SMART-Navigation project, as set out in document HGDM 1/5/5 (Republic of Korea).

4.6 The group agreed that it was prudent to have a common understanding of a Maritime Service Portfolio (MSP) prior to developing Guidance on the harmonized format and structure of MSPs, and decided to work on a revised definition of MSPs first.

5 Definition of Maritime Service Portfolio

5.1 The group considered a revision of the definition of Maritime Service Portfolio (MSP), as part of the task of the output and in order to have a clear understanding of the scope and meaning of an MSP.

5.2 After some discussion the group agreed to a revised definition of MSPs which was more concise and believed to capture the purpose and scope of MSPs better than the existing definition. The term 'Maritime Service' was introduced into the definition and intended to emphasize that a Portfolio comprised two or more related maritime services which were grouped together. Hence the group decided that the current list of MSPs in the IMO e-navigation Strategy Implementation Plan (SIP) should not be called a list of MSPs but rather a list of e-navigation 'Maritime Services'.

6 High-level template for MSPs

6.1 In discussing how to proceed on the development of the Guidance the group agreed to work on the template for MSPs first, as contained in annex 1 of document HGDM 1/5/1 (Australia et al.), together with document HGDM 1/5/6 (IALA) informing on the update on the work by IALA. It was noted that a template would be a good tool to achieve harmonization in the provision of digital information but that it should take a high level perspective and not include detailed technical information.

6.2 With the change of the definition for MSPs, as reported under section 5 above, the group agreed to subsequently change the title of the template to *Template for a Maritime Service* (instead of MSP).

6.3 In discussing the purpose of the template the group agreed that the Guidance should serve as a tool to assist in the transition from traditional information provided to ships to the provision of digital information, using the existing framework of IMO's instruments that described the information which was to be communicated to and from the ship. With the definition of format and structure the Guidance would describe how the maritime service would be structured to facilitate digitalization.

6.4 The group acknowledged that the description of the operational service needed to be differentiated from the physical service (e.g. information on tug services available in a port versus the actual service of towing or manoeuvring a ship by the use of tugs). It was therefore agreed that the Guidance should describe and help implement the operational service by providing the maritime service-related information.

6.5 In considering the role of the Organization, it was agreed that IMO had the lead role on e-navigation development and implementation, and therefore should manage and control the development of maritime services to achieve harmonization.

6.6 After a long discussion the group agreed to the template that should be used by domain coordinating bodies, and included the template in appendix 1 of the draft Guidance (annex, appendix 1).

6.7 Several delegations were of the view that, in order to test the new template in the annex, international domain coordinating bodies, such as IHO and IALA, should be invited to use the template. By testing the template the group felt that it would have a basis to harmonize maritime services and better be able to complete the Guidance. The group therefore agreed to request the Sub-Committee to consider the option of inviting international organizations which were domain coordinating bodies to use the template and submit completed templates to the Organization for consideration.

7 Role of the Organization and other organizations

7.1 In considering document HGDM 1/5 (IHO and IALA) proposing four levels of governance and architecture, the group agreed that such proposed rigid governance was not needed.

7.2 While for some maritime services domain coordinating bodies already existed, such as those falling under the S-100 framework, for other maritime services this might not be the case.

7.3 After some discussion the group agreed on three levels of control and ownership, with the Organization having the leadership and overarching control of maritime services and requiring domain coordinating bodies, when developing maritime services, to use the template in the annex. The group concluded that there was a the need for procedures and actions to be taken by the Organization after receiving the completed Maritime Service template from a domain coordinating body

7.4 Besides the overarching coordination level that the group proposed to be taken by the Organization, a functional and operational, as well as a service level were defined in section 3 of the draft Guidance on "Three levels of control and leadership".

8 Standardised data element ID structure

8.1 The group, in considering document HGDM 1/5/3 (BIMCO) proposing to standardize data elements identity (ID), agreed that the harmonization of data element IDs was a key enabler to ensure inter-operability between services and to facilitate machine to machine communication. Hence there was strong support in the group for BIMCO's submission.

8.2 In this respect, the group recalled that the FAL Committee was currently working on standard data sets for the FAL forms used by ships, in close cooperation with WCO, UN/CEFACT and ISO. It was therefore the view of the group to inform the FAL Committee of the discussion in the group on this matter and the need to have harmonized data element IDs for the delivery of maritime services. The work should also cover data elements beyond those required by the FAL Convention.

8.3 There was agreement in the group that a challenge faced in the harmonization of data

element IDs for maritime data was the large number of data models developed by different international bodies that did not conform to the S-100 framework.

8.4 In discussing the possible solutions to ensure that users of the Guidance would apply unified data element IDs, the group considered to establish a mechanism to issue, manage and make them available for use by stakeholders. A data model that reflected the structure of such a proposed identification system (including all associated metadata) should be developed and maintained by a competent international body, such as IMO.

8.5 It was proposed that a registry framework (similar to the one established by the IHO) would provide an appropriate mechanism for managing the individual registers (data bases) containing the ship identifier information and associated metadata. Furthermore, it was suggested that the Maritime Resource Name (MRN*) framework could be used for data models such as, for example, the IMO identification numbers for ships.

8.6 After an extensive discussion the group agreed that a maritime registry, listing and cross-referencing standards and all maritime-relevant data element IDs should be established so as to be able to refer to such registry in the Guidance and to support global harmonization. Views were noted that the Organization, as the body that had leadership and overarching control on the harmonization of maritime services could develop such a registry, incorporating the data element IDs developed by international organizations for their domain, possibly using the GISIS functionality.

8.7 While supporting the need to harmonize data element IDs at IMO level, the group noted that no documents had been submitted to provide possible solutions to coordinate the various data element IDs. Concerns were also raised in respect to the substantial work required for this issue. It was therefore agreed to suggest to the Sub-Committee to consider the proposal for the establishment of a registry and to request coordination with the MSC and FAL Committee on this issue, bearing in mind that the FAL Committee was already working on a set of more than 100 data elements.

8.8 Given the aforementioned constraints in considering this matter, the group agreed to invite BIMCO to submit their document to the next session of the NCSR Sub-Committee.

9 Sea areas of implementation

9.1 The group considered document HGDM 1/5/4 (France) proposing to use the GMDSS sea areas A1, A2 , A3 and A4, in lieu of the 6 defined sea areas in the SIP.

9.2 While there was no general support for the proposal in document HGDM 1/5/4, the group agreed to delete the information on sea areas in the template as it was considered that the Maritime Service could be promulgated by various means of communication, with each having a different coverage. The group agreed that the coverage of a Maritime Service could be specified under the 'additional details' in section 3 of the template.

10 Specification of technical services for MSPs

10.1 The group considered the inclusion of the draft IALA Guideline for specification of

* Maritime Resource Name (MRN); see www.mrnregistry.org.

e-navigation technical services, as set out in annex 2 of document HGDM 1/5/2 (Australia et al.) and noted that the IALA Guideline provided for a harmonized format and structure of data for delivering Maritime Services (previously referred to as MSPs).

10.2 After careful consideration, the group agreed to not include text from the draft IALA Guideline as it was too technical in nature, not yet finalized and not appropriate for the high-level guidance which the group was tasked to develop.

10.3 However, the group noted the need for a guideline for the specification of technical services and noted IALA's statement that the work on the *IALA Guideline on specification of e-navigation technical services* had been finalized but needed internal approval. Consequently, the group requested IALA to submit the final approved version, preferably to NCSR 5, together with a short non-technical description that explained the nature and need for the guideline.

10.4 The group also noted that there were other guidelines currently being developed and, in this context, the group encouraged international organizations as domain owners to cooperate and harmonize their guidelines to the greatest extent possible.

10.5 In discussing interoperability of technical services by domain coordinating bodies, the delegation of the United States expressed the view that the group had entered into a debate that would impose technical description of maritime services which was not in line with the methods of work of the Organization.

10.6 Other delegations stated that the current wording in the draft Guidance did not conflict with the defined remit of the Organization and that technical considerations and coordination should be left to the domain coordinating bodies.

10.7 The observer from ICS stated that the lack of a common understanding of the expected performance of Maritime Service constituted a difficulty as it could not be benchmarked against an IMO performance standard.

10.8 In response to the lack of a performance standard, the delegation of Australia expressed the view that the development of a related performance standard would take considerable time and with the fast advancing technological developments might, after finalization, not reflect the industry practice at the time of completion.

11 Terminology used

11.1 The group agreed to include in the draft Guidance a section on terminology used so as to promote a common understanding of the context of delivering Maritime Services. The list of provisional terms used is given in section 6 of the draft Guidance (annex).

12 Further development of the Guidance

12.1 In considering document HGDM 1/6 (Australia et al.), the group discussed how to proceed in order to progress the work on the draft Guidance.

12.2 The group agreed that the draft Guidance currently lacked details, especially in respect to technical information on the harmonization of format and structure of maritime services. While it was considered not appropriate to include text from the draft IALA Guideline for specification of

e-navigation technical services (see paragraphs 10.1 to 10.4), the short non-technical description of the finalized IALA Guideline (see paragraph 10.3) could be inserted as an appendix of the document.

12.3 As part of the discussion on how to progress the work on the draft Guidance further, the group considered the current Terms of Reference (MSC 90/28/Add.1, annex 22), together with the instructions received from MSC 98. While it was agreed that the current terms of reference were broad enough to continue the work, given the limitation set by MSC 98, it was noted by the group that they restricted the development of the MSPs to SOLAS-related services. However, the scope of work of the group had been expanded and included also maritime services not governed by SOLAS. The group therefore agreed to bring this matter to the attention of the Sub-Committee.

12.4 There was consensus in the group that the current draft was at a very early stage of development and required more input in the future. Given the large amount of work necessary to finalize the draft Guidance, the group agreed to request NCSR 5 to invite MSC 99 to approve the holding of a second meeting of the HGDM.

13 ACTION REQUESTED OF THE SUB-COMMITTEE

13.1 The Sub-Committee is invited to:

.1 note the first draft of the *Guidance on the definition and harmonization of the format and structure of maritime services within the Maritime Service Portfolio (MSP)*, including the template for maritime services (annex);

.2 consider the revised definition of MSP which is more concise and believed to capture the purpose and scope of MSPs better than the existing definition (paragraph 5.2 and section 6 of the annex);

.3 consider to invite international organizations which are domain coordinating bodies to use the template and to submit completed templates to the Organization as part of testing its purpose and suitability, and in order to be able to facilitate the completion of the draft Guidance (paragraph 6.7);

.4 note the HGDM's proposal to establish three levels of control and ownership (paragraph 7.3 and section 3 of the annex);

.5 note the view of the group on the need to harmonize data element IDs for marine services as a key enabler to ensure inter-operability between services (paragraph 8.1);

.6 consider to inform the FAL Committee on the ongoing discussion of the group on the harmonization of data element IDs for marine services (paragraphs 8.1 to 8.8);

.7 consider the proposal to establish a maritime registry, listing all maritime-relevant data element IDs, for use in the provision of maritime services, with the Organization as possible host for such registry (paragraph 8.7);

.8 consider to request coordination with the MSC and FAL Committee on this issue of establishing a maritime registry (paragraph 8.7);

.9 note the group's discussion on the technical aspects of maritime services (paragraphs 10.5 to 10.8);

.10 note the group's concern in respect to the current terms of reference which limit the work to SOLAS-related maritime services (paragraph 12.3);

.11 invite the Committee to approve the holding of a second meeting of the HGDM (paragraph 12.4); and

.12 note the report in general.

***

ANNEX

DRAFT MSC RESOLUTION

DRAFT IMO GUIDANCE ON THE DEFINITION AND HARMONIZATION OF THE FORMAT AND STRUCTURE OF MARITIME SERVICES WITHIN THE MARITIME SERVICE PORTFOLIO (MSP)

[1 The Maritime Safety Committee, at its one-hundred-and-first session (XX May/June 2019),

Xx This guidance should be reviewed in order to ensure that future Maritime Services follow a uniform general format and structure data model, based on the S-100 standard.

[more to come]

XX Member States are invited to apply and bring the annexed Guidance to the attention of administrations, national and regional providers of maritime safety information (MSI), ship equipment manufacturers, shipowners, operators and all other parties concerned for application to all….]

Annex

[1 Introduction

1.1 Modern shipping relies on a large amount of data and information to safely navigate from berth to berth. A very important set of information is promulgated as maritime safety information (MSI), as defined in resolution A.705(17)[1], as amended. MSI include navigational warnings, meteorological information and other urgent safety-related information. In addition to being safety-relevant, marine information services are used for optimizing voyage routes, which can include the best passage through ice, a pirate-infested area or avoiding the known path of marine mammals. Route optimization may also include taking advantage of favourable winds and currents and engine loads may be adjusted accordingly.

1.2 To assess the dynamic effects mentioned above, the ship's bridge team needs up to date information on all relevant marine information along the planned route, as well as information on any security risks, wave heights, swell and any information affecting the safe transit. The information flow also comprises ship to shore communications, particularly prior to entering the coastal waters of a State, a ship is usually requested to provide details of her voyage, cargo, crew and passengers on board, advising on the next port of call and other information. Ship to ship, ship to shore and shore to shore information exchange enable new services and technologies to improve safety and efficiency of shipping. All those marine information services are being considered to be transitioned from conventional transmission methods to contemporary digital technologies.

1.3 IMO as the lead organization for implementing e-navigation has agreed to take on the oversight work on providing marine information services for ships in a unified, digital format. Such marine information have been termed "Maritime Services" and this guidance envisages to harmonize the structure and formats of digitally-transmitted data and information and to display them in a harmonized way on the ship's bridge or shore-based facilities broadcasting and receiving marine information.

1.4 This Guidance envisages to harmonize the format and structure of a sub-set of marine information, namely Maritime Service Portfolios (MSPs). There are currently 16 Maritime Service Portfolios described in the SIP, each of them covering a certain service available to the ship (see NCSR 1/9 for the full list of MSPs). For example, MSI are promulgated as required by the functional requirement of the GMDSS, an internationally (WWRNWS and WWMIWS) and nationally coordinated network of broadcasts providing necessary information to ships for safe navigation, received by equipment which automatically monitors the appropriate transmissions, displays the information relevant for the voyage and provides a print capability.

1.5 MSI are transmitted using narrow band direct printing (NBDP) over NAVTEX, SafetyNet and HF within the GMDSS. As part of the current modernization of the GMDSS, new technologies are being considered that use digital information exchange, opening up the possibility to receive MSI in a more user-friendly way. Hence this Guidance is intended to provide an all-encompassing guidance to ensure that the format and structure for each of the data elements for each MSP follows the same structure and format. Therefore, SIP requires that all data models are S-100 conformant. The S-100 standard is a method for data modelling, developed and overseen by the International Hydrographic Organization (IHO). Based on the S-100 data modelling method a common maritime data structure (CMDS) is to be developed which forms the basis of developing specifications for digital data products.

[1] A.705(17), as amended on *Promulgation of maritime safety information (MSI)*. MSC.1/Circ.1310/Rev.1 on *Revised Joint IMO/IHO/WMO Manual on Maritime Safety Information (MSI)*.

1.6 This Guidance set out the general requirements for a service data model which, when a S-100 product specification exists for an MSP (e.g. S-124 on product specification for navigational warnings), then such S-xxx structures should be used and each data item of the service.

1.7 As not all operational data can be easily incorporated into the CMDS based on a S-100 data model this guidance provides a harmonized solution for the format and structure of all data models used as part for of a Maritime Service. Future Maritime Services will need to follow the format and structure of data elements already described in this guidance.]

2 Purpose

2.1 The purpose of this Guidance is to foster and to harmonize the implementation of the maritime services by providing templates for the description of these operational services, including references to their associated technical services, which should be used to implement them.

3 Three levels of control or leadership

Overarching coordination level
3.1 The Organization, in its role as leading e-navigation development and implementation, is responsible for guiding the establishment and harmonisation of maritime services. This includes providing leadership and overarching control and harmonisation of maritime services through the provision of guidance.

Functional and operational level
3.2 International organisations propose the definition of a specific maritime service, using the template as provided in annex [1], to the Organization and manage and maintain the agreed definition through harmonized operational and technical specifications.

3.3 International organizations as domain coordinating bodies, such as IHO and IALA, provide guidelines to stakeholders and provide domain management. This should include description of current and future operational maritime services and identification and specification of associated technical services.

[Service level
3.4 Service providers – Member States and authorities within Member States (e.g. port authorities, Hydrographic Offices, SAR services, etc)**]**

4 Application of the Guidance

4.1 This Guidance is recommended for administrations, international organisations as domain coordinating bodies and service providers.

4.2 For further information on a specific maritime service, other relevant standards and publications should be taken into account.

5 Information on associated technical services

[5.1 The interoperability of technical services is ensured by a coordinated approach of the domain coordinating bodies to define needed communication means and data models.]

[5.2 Technical services should follow the appropriate guidance and product specification developed by the appropriate domain coordinating body and, where appropriate, be based on the S-100 framework with associated S-XXX product specifications.]

[**5bis Harmonizing data element IDs**] (*based on BIMCO submission HGDM 1/5/3*)

6 Terminology used

For the purpose of the Guidance, unless expressly provided otherwise:

.1 *Maritime Service Portfolio (MSP)* ~~defines and describes the~~ a set of operational ~~and technical~~ Maritime Sservices and associated technical services provided in digital format ~~their level of service provided by a stakeholder in a given sea area, waterway, or port, as appropriate. Hence, a "Maritime Service Portfolio" may also be construed as a set of "products" provided by a stakeholder in a given sea area, waterway, or port, as appropriate~~.

.2 [*Common Maritime Data Structure (CMDS)* is based on the S-100 Universal Hydrographic Model of the International Hydrographic Organization. The S-100 standard is a method for data modelling by the International Hydrographic Organization (IHO). Based on the S-100 data modelling method a common maritime data structure (CMDS) is to be developed which forms the basis of developing specifications for digital data products.]

.3 *Maritime Service……*

.4 *Operational Service… [*means the specification of a service from the operational perspective. This covers purpose and application of the service, stakeholders, regulations and processes and information exchanged. Operational Services are implemented with the assistance by a set of Technical Services.]

.5 *Technical Services…* [are developed to implement the operational services. For example, the promulgation of tidal information from shore to ship by broadcasting data which is structured and encoded as specified by IHO's S-104 standard. For Technical Services a specification should be given which contains services overview, service identification, operational Context, Service Data Model, Interface Specification including communication mechanisms, Dynamic Behavior for example]

.6 *S-100* ….[(to be provided by IHO – Tony Pharaoh) is a data modelling, encoding and portrayal framework that uses and extends the ISO 19000 series of geographic standards for hydrographic, maritime and related issues. By using the framework specific data models and portrayals are defined by a set of "S-100 Product Specifications" which are named by 3-digit numbers (S-XXX).]

.7 [A *Data Model* is an abstract model that organizes elements of data and standardizes how they relate to one another and to properties of the real world entities. For instance, a data model may specify that the data element representing an Aid to Navigation (AtoN) specification be composed of a number of other elements which, in turn, represent the position, color and lights of the AtoN and define its owner.]

Appendix 1

TEMPLATE FOR A MARITIME SERVICE

This template should be used by international organizations to describe the maritime services that are within their remit. Descriptions of maritime services provided to the IMO using this template will enable the IMO to exercise, leadership and overarching oversight and to provide a globally harmonized list of maritime services.

To ensure a standardized approach in the development and implementation of maritime services, the content should include a general description of the operational services, and a reference to associated technical services that will enable the exchange of information in digital format.

1. Title of the maritime service (Maritime Service number)

2. Submitting Organization

3. Description of the maritime service

Stating the exact nature and scope of the maritime service in accordance, if applicable, with existing IMO instruments. Additional details might be added for clarity as required.

4. Purpose

What is the purpose of the maritime service?
What value does it bring to its intended stakeholders?
Is the maritime service compliant with regulatory requirements, if applicable?

In the case that the maritime service covers existing services, a description of the steps required to transition from analogue to digital information promulgation must be included.

5. Operational approach

How is the purpose of the maritime service achieved, taking into account existing guidance of the Organization and other international bodies?

6. User needs

Describe the user needs the maritime service addresses. In so doing make reference to any relevant IMO instruments and, where applicable, include one or more use cases.

7. Information to be provided

List the information elements the maritime service provides. The information elements will be the starting point for data modelling, as part of the technical services to access, promulgate or exchange the information.

8. Associated technical services

Using the table below list existing or potential technical services associated with this maritime service.

Name	ID (MRN) *	Description	Architect(s)	Standardisation body

9. Relation to other maritime services

Describe any relationships between this and other maritime services such as interdependencies or areas of overlap. This section should clarify the nature of interdependencies, overlaps and provide recommendations for their resolution.

* Maritime Resource Name (MRN); see www.mrnregistry.org

Appendix 2

DESCRIPTION OF THE GUIDELINE FOR SPECIFICATION OF E-NAVIGATION TECHNICAL SERVICES

(IALA requested to submit a short non-technical description of the IALA Guideline for specification of e-navigation technical services to be inserted here)