Paper for Consideration by NIPWG

IMO e-navigation MSP Hydrographic Services

Submitted by:	NIPWG Chairgroup
Executive Summary:	Outcome of the discussion with other HSSC WG on contribution to the MSP MSP development work
Related Documents:	HSSC7 (action item 7/35)
Related Projects:	IMO e-navigation

Introduction / Background

The development of e-navigation under the overall coordination of the IMO is guided by a Strategy Implementation Plan (SIP), which was approved by MSC 94 in November 2014. The SIP (NCSR1/28, annex 7) identifies Maritime Service Portfolios (MSPs) as the future means of providing digital ship to shore and shore to ship information services in a harmonized way.

The concept of MSP defines and describes the set of operational and technical services and their level of service provided by a stakeholder in a given sea area, waterway, or port, as appropriate.

The SIP identifies six different areas for the delivery of MSPs:

1. port areas and approaches;
2. coastal waters and confined or restricted areas;
3. open sea and open areas;
4. areas with offshore and/or infrastructure developments;
5. Polar areas; and
6. other remote areas.

The way forward for MSPs is assigned to SIP task T17 stating "Further develop the MSPs to refine services and responsibilities ahead of implementing transition arrangements". An initial list of MSPs has been annexed to the SIP. This paper lists 16 different MSPs:

MSP	Service	Service Provider	Short Description
MSP1	VTS Information Service (IS)	VTS Authority	
MSP2	Navigational Assistance Service (NAS)	National Competent VTS Authority/Coastal or Port Authority	
MSP3	Traffic Organization Service (TOS)	National Competent VTS Authority/Coastal or Port Authority	
MSP4	Local Port Service (LPS)	Local Port/Harbour Operator	
MSP5	Maritime Safety Information Service (MSI)	National Competent Authority	The Global Maritime Distress and Safety System (GMDSS) as described in SOLAS chapter IV defines the seventh functional requirement as: "Every ship, while at sea, shall be capable of transmitting and receiving maritime safety information". The MSI service is an internationally coordinated network of broadcasts of Maritime Safety Information from official information providers, such as: National Hydrographic Offices, for navigational warnings and chart correction data; National Meteorological Offices, for weather warnings and forecasts; Rescue Co-ordination Centres (RCCs), for shore-to-ship distress alerts; and

MSP	Service	Service Provider	Short Description
			the International Ice Patrol, for Oceanic ice hazards. Specific information on Aids to Navigation and restrictions on safe navigation are part of MSI services provided by National Authorities. This can include but is not limited to, the following type of information to be available to mariners: status of Aids to Navigation; status of GPS and DGPs; buoy tendering operation; and restrictions on safe navigation such as bridge/hydro cable air gap, new hazards, construction or dredging operations.
MSP6	Pilotage service	Pilot Authority/Pilot Organization	
MSP7	Tugs Service	Tug Authority	
MSP8	Vessel Shore Reporting	National Competent Authority, Shipowner/Operator/Master	
MSP9	Telemedical Assistance Service (TMAS)	National Health Organization/dedicated Health Organization	
MSP 10	Maritime Assistance Service (MAS)	Coastal/Port Authority/Organization	
MSP 11	Nautical Chart Service	National Hydrographic Authority/ Organization	The aim of the nautical chart service is to safeguard navigation at sea by providing information such as nature and form of the coast, water depth, tides table, obstructions and other dangers to navigation, location and type of aids to navigation. The Nautical Chart service also ensure the distribution, update and licensing of electronic chart to vessels and other maritime parties.
MSP 12	Nautical Publications Service	National Hydrographic Authority/ Organization	The aim of the nautical publication service is to promote navigation awareness and safe navigation of ships. The nature of waterways described by any given nautical publication changes regularly, and a mariner navigating by use of an old or uncorrected publication is courting disaster. Nautical publications include: tidal currents, aids to navigation system, buoys and fog signals, radio aids to marine navigation, chart symbols, terms and abbreviations, sailing directions; and a Chart and Publication Correction Record Card system can be used to ensure that every publication is properly corrected prior use by mariners.
MSP 13	Ice Navigation Service	National Competent Authority/ Organization	The ice navigation service is critical to safeguard the ship navigation in ice-infested waters, given how quickly the ice maps become outdated in the rapid changing conditions of the ice-covered navigational regions. Such services include: ice condition information and operational recommendations/advice; ice condition around a vessel; vessel routing; vessel escort and ice breaking;

MSP	Service	Service Provider	Short Description
			ice drift load and momentum; and ice patrol.
MSP 14	Meteorological Information Service	National Meteorological Authority/WMO/ Public Institutions	
MSP 15	Real-time Hydrographic and Environmental Information Service	National Hydrographic and Meteorological Authorities	The real-time hydrographic and environmental information service is essential to safeguard navigation at sea and protect the environment. The services provided are such as: current speed and direction; wave height; marine habitat and bathymetry; Sailing Directions (or pilots): detailed descriptions of areas of the sea, shipping routes, harbours, aids to navigation, regulations, etc.; lists of lights: descriptions of lighthouses and lightbouys; tide surge prediction tables and tidal stream atlases; ephemerides and nautical almanacs for celestial navigation; and notice to mariners: periodical (often weekly) updates and corrections for nautical charts and publications.
MSP 16	Search and Rescue Service	SAR Authorities	

Certain MSPs address services which are under the remit of other IRCC or HSSC WGs. A letter was provided to seek the feedback from these WGs and to evaluate how they could contribute to the MSP development.

Analysis/Discussion

It was assumed that five services out of the above mentioned list are affected by themes and responsibilities within the IHO scope. Those are

- MSP 5 - Maritime Safety Information (MSI) service;
- MSP 11 - Nautical chart service;
- MSP 12 - Nautical publications service;
- MSP 13 - Ice navigation service; and
- MSP 15 - Real-time hydrographic and environmental information service.
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The IHO's position is that these MSPs in their strict segmentation reflect the traditional methods of promulgating nautical information. In IHO´s opinion reflected in the associated report to NAV59 (NAV59/6/4), the themes of these MSPs do not address the desired flexibility offered by digital products and electronic display and information systems in the context of e-navigation and should therefore be revised.

In order to progress task T17, MSC 96/23/7 proposes a new output on e-navigation related to Maritime Service Portfolios (MSPs). It aims to define and harmonize the format and structure of MSPs and to provide guidance on the appropriate communication channels used for the electronic exchange of information between shore and ship, including any necessary coordination mechanisms and transitional arrangements that may be required. This document acknowledges that the **IHO has agreed to coordinate the development of MSPs within its remit**. In this context concerns on the possible duplication of efforts, development of regional solutions, use of different communication systems and the provision of superfluous or non-interoperable information were raised. The document proposes to harmonize the format and structure of MSPs and to assign this work to NCSR as the coordinating organ.

As a result of the above mentioned activities, and based on action item HSSC7/35, the NIPWG started the discussion process on which type of MSP(s) would sufficiently match the scope of the Hydrographic Authorities/ Organizations in both technical and organisational aspects.

It was proposed to merge the MSPs 11, 12 and the MSP 5 parts pertaining to the hydrographic offices/agencies. The WWNWS-SC's opinion is that MSP 5 (MSI) should not be merged with other hydro parts. MSI/NavigationalWarning service is the subject of an existing organization. It should be considered that in certain places the GMDSS/WWNWS coordination doesn't belong to hydrographic offices.
The WWNWS-SC is the opinion that a hydrographic service MSP should be a merger of MSP 11-13 and 15.

MSP	Service	Service Provider	Short Description
MSP xx	Hydrographic Services	National Hydrographic Authority/ Organization	Provision of SOLAS V compliant static and real-time nautical information based on the S-100 universal hydrographic data model. The nautical information is also available for other stakeholders. The information is to be delivered and maintained in form of interoperable product specifications. The portrayal of information is harmonized. The provision of the information is based on a common data quality specification. In addition to the protection of the environment, the aim is to promote navigation awareness, and safeguard navigation at sea by providing descriptive information such as: areas of the sea, nature and form of the coast, nature of waterways, shipping routes, water depth, obstructions and other dangers to navigation, aids to navigation system, details of aids to navigation, harbours, tide surge prediction, tidal currents, tidal streams, Ephemerides and nautical almanacs for celestial navigation. The real-time hydrographic and environmental information service provides information such as: current speed and direction, height of the tide, wave height, marine habitat and bathymetry. A sophisticated licensing service is established. A sophisticated distribution, and update service is established. Hydrographic information coming from various sources is being submitted in a push or pull mode directly to the end user system in a pre-processed format or with no additional intervention.

Commented [YLF1]: Including updates

Commented [YLF2]: I propose to extend the list for making clear the scope the Hydrographic Service -> landmarks, regulations, limits, natural conditions, offshore installations, ports approaches, fairways, anchorages, nature of the seabed, directions for passages, radio services and other maritime services.

Commented [YLF3]: Not sure that real-time information is an established hydrographic service from HOs.

Commented [YLF4]: This is about current portfolio. The future method that has not been established should not be included in this table at this stage.

Commented [YLF5]: "coming from various sources" is confusing here. It seems to reflect how HOs proceed to make up the delivered information. Perhaps, this point could be developed separately to explain the added value of Hydro MSP (collection of data from various sources to provide **qualified and useful information for navigation**, delivered in a timely manner to support safe navigation and taking into account the MSI service for urgent information).

Commented [YLF6]: Nautical Charts are emblematic of HOs production for navigation. ECDIS is one the base elements of e-navigation. "Nautical charts" or "nautical chart data" should be mentioned somewhere.

Conclusions
The e-navigation concept is based on the assumption that an ubiquitous communication infrastructure providing sufficient bandwidth for ship shore interaction will be permanently available. That offers new possibilities for the provision and updating of nautical publications, such as books, charts and supplementary publications and for the provision of real-time data.

Considering that the assumed technical infrastructure will be available in the future, the distinction between chart, publication and real time data delivery is no longer required. Instead, a combined data stream of charted and text

oriented information describing and maintaining the same subject could be handled by the respective end users application on both sea and shore side. In addition, these information packages could be enhanced with real-time information.

Consideration is needed to define what kind of information is core hydrographic information related to the MSP and what kind of information is inside or outside the HOs responsibility. The proposed MSP "Hydrographic Service" should not provide information outside the hydrographic domain.

The MSP should provide information on which distribution way is being used. That should inter alia include the employment of current and future MSI data transmission methods.

Referring to http://www.iho.int/mtg_docs/circular_letters/english/2016/Cl24e.pdf (E-navigation section), the MSC put an action in their post-biennial agenda (2018-2019) to "Develop guidance on definition and harmonization of the format and structure of Maritime Service Portfolios (MSPs)" for which the NCSR will be the coordinating body. That offers a sufficient time frame to the IHO to develop a clear view on what should be part of the MSP "Hydrographic Service". Having developed the cornerstones of the said MSP, it would be feasible to deliver the MSP in due course in a correct format and structure as it will be requested by the IMO.

Recommendations

Based on the drafted MSP and the received comments by the WWNWS-SC, the NIPWG should persistently seek feedback from the NCWG and TWCWG to develop a common view of what kind of hydrographic information the MSP "Hydrographic Service" should cover.

Later, the main deliverables and the proposed provision ways for these deliverables should be described. In addition and if considered necessary, intermediate steps during the transition phase from the current way of information provision to the future way of information provision should be described.

Action Required of NIPWG

The NIPWG is invited

- to note this paper,
- to act as appropriate.