INTERNATIONAL MARITIME ORGANIZATION

E

SUB-COMMITTEE ON SAFETY OF NAVIGATION
57th session
Agenda items 5 and 6

NAV 57/WP.6
8 June 2011
Original: ENGLISH

DEVELOPMENT OF AN E-NAVIGATION STRATEGY IMPLEMENTATION PLAN

Report of the Working Group

1 GENERAL

1.1 As instructed by the Sub-Committee, the Working Group on development of an e-navigation strategy implementation plan (the Group) met on 7 and 8 June 2011 under the chairmanship of Mr. John Erik Hagen (Norway).

1.2 The Group was attended by delegates from the following Member States:

ANTIGUA AND BARBUDA
ARGENTINA
AUSTRALIA
BAHAMAS
BRAZIL
CANADA
CHILE
CHINA
DENMARK
FINLAND
FRANCE
GERMANY
GREECE
ISLAMIC REPUBLIC OF IRAN
ITALY
JAPAN
LIBERIA
MARSHALL ISLANDS
NETHERLANDS
NIGERIA
NORWAY
PANAMA
POLAND
REPUBLIC OF KOREA
RUSSIAN FEDERATION
SINGAPORE
SPAIN
SWEDEN
THAILAND
UKRAINE
UNITED KINGDOM
UNITED STATES

1.3 The Group was also attended by a delegate from the following Associate Member of IMO:

HONG KONG, CHINA

and observers from the following intergovernmental and non-governmental organizations in consultative status:

EUROPEAN COMMISSION (EC)
INTERNATIONAL CHAMBER OF SHIPPING (ICS)
INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)
INTERNATIONAL HYDROGRAPHIC ORGANIZATION (IHO)
COMITÉ INTERNATIONAL RADIO-MARITIME (CIRM)
BIMCO
OIL COMPANIES INTERNATIONAL MARINE FORUM (OCIMF)
INTERNATIONAL TRANSPORT WORKERS' FEDERATION (ITF)
INTERNATIONAL ASSOCIATION OF MARINE AIDS TO NAVIGATION AND LIGHTHOUSE AUTHORITIES (IALA)
INTERNATIONAL ASSOCIATION OF INSTITUTES OF NAVIGATION (IAIN)
INTERNATIONAL ASSOCIATION OF INDEPENDENT TANKER OWNERS (INTERTANKO)
INTERNATIONAL MARITIME RESCUE FEDERATION (IMRF)
CRUISE LINES INTERNATIONAL ASSOCIATION (CLIA)
THE NAUTICAL INSTITUTE (NI)

2 TERMS OF REFERENCE

2.1 The Group should consider the relevant documents submitted under agenda item 6, in particular, NAV 57/6 (Norway), NAV 57/6/2 and NAV 57/6/3 (Republic of Korea), NAV 57/6/4 (IALA), NAV 57/6/5 (Japan), NAV 57/6/6 (United Kingdom), NAV 57/6/7 (Australia), including the information provided in documents NAV 57/INF.4 (Republic of Korea), NAV 57/INF.5 (Australia), NAV 57/INF.7, NAV 57/INF.8 (Japan) and NAV 57/5/1 (Secretariat), plus the outcome of NAV 56, STW 42, COMSAR 15 and taking into account any decisions of, and comments and proposals made in Plenary, undertake the following tasks:

.1 review the report of the correspondence group and provide comments and recommendations with respect to the actions requested in paragraphs 61.1 to 61.8 and 61.10 of document NAV 57/6;

.2 review document NAV 57/5/1 concerning Report ITU-R M.2201 (11/2010) – Utilization of the 495-505 kHz band by the maritime mobile service for the digital broadcasting of safety and security related information from shore-to-ships and identify its relevance with respect to e-navigation;

.3 review and update the table on the overall planning for the 2009 – 2012 strategy implementation plan (MSC 86/23/4, annex, page 7);

.4 review and revise the terms of reference for a correspondence group to progress work intersessionally for reporting to COMSAR 16, STW 43 and NAV 58, based on the joint plan of work approved by MSC 86; and

.5 submit a report to Plenary on Thursday, 9 June 2011 for consideration at Plenary.

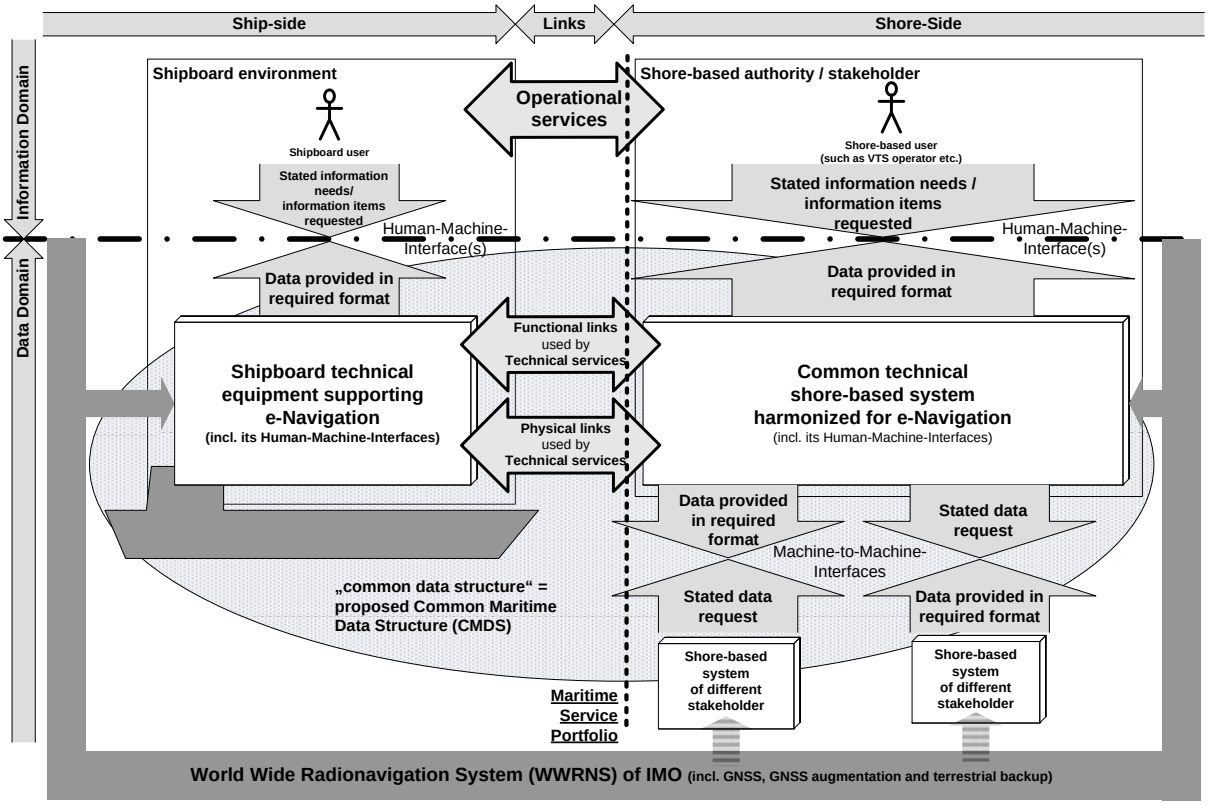
3 REPORT OF THE CORRESPONDENCE GROUP ON E-NAVIGATION

3.1 The Group reviewed the report of the correspondence group and provided comments and recommended actions as outlined in the ensuing paragraphs.

Overarching e-navigation architecture

3.2 The Group reviewed the complete overarching e-navigation architecture prepared by the correspondence group and discussed a number of issues concerning, in particular, ship-to-ship communications, the relationship and sharing of information between stakeholders and matters related to shore-based users, authorities and stakeholders.

3.3 Having concurred with the proposal of the correspondence group with some minor amendments, the Group prepared a revised version of the overarching e-navigation architecture, as shown in figure 1.



Note: There are operational and technical interactions between different shipboard environments. These are not shown for simplicity's sake in this figure.

Figure 1: Overarching e-navigation architecture

3.4 The overarching e-navigation architecture described in figure 1 included, in the horizontal direction, the shipboard and the shore-based parts connected through different links put into a hierarchical perspective (operational services and functional and physical links used by technical services), stressing the harmonization requirement which was the essence of the e-navigation definition and highlighting the information/data flow in the e-navigation architecture. In the vertical direction, a distinction between the information and data domains were represented, including the human/machine Interfaces that interconnect the two domains and provide information and data items to the human users in the required format.

3.5 The above architecture also identified the concept of Maritime Service Portfolio (MSP) which 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. This concept would be further developed in the future.

3.6 The figure explains the relationship of shore-to-shore data exchange and two additional important features were defined:

.1 the Common Maritime Data Structure (CMDS) that spans the whole of the horizontal axis (indicated by the shaded oval in the background), which serves an important function as it is a key to harmonization between the technical systems of stakeholders both shipboard and shore-based; and

.2 the World Wide Radio Navigation System (WWRNS), which delivers in particular the position and time data to virtually all technical systems in e-navigation. The degree of this dependency might differ for several shore-based systems (indicated by different arrow shading).

3.7 The Group noted that, for simplicity of representation, the ship-to-ship interactions were not shown, although they were an integral part of the e-navigation. The structural details of both the technical shipboard and common shore-based e-navigation system architectures were not yet shown at this stage. Different figures would be required to be developed in the future in this respect.

3.8 The Group also noted that a key shipboard platform would be the Integrated Navigation System (INS) (NAV 57/6, paragraph 25) and that IALA was working on the common shore-based e-navigation system architecture for its membership of Aids-to-Navigation and VTS authorities.

3.9 The Group invited the Sub-Committee to agree on the current overarching e-navigation architecture with a view to forwarding it to the Committee for approval.

3.10 The Group, whilst considering e-navigation as an ongoing and dynamic process, recalled that the overarching e-navigation architecture should be kept under review.

3.11 The Group recommended tasking the correspondence group to further develop the detailed architecture of both the ship and shore sides, as appropriate, taking into account the outcomes of the gap analysis.

Development of a Common Maritime Data Structure (CMDS)

3.12 The Group reviewed the correspondence group's proposal on how the CMDS could be developed and recognized that the CMDS:

.1 should be based on user requirements;

.2 could represent any maritime entity and should be extended by the addition of new entities;

.3 should be accessible to any stakeholder or implementer;

.4 should be an abstract representation of parts of the maritime domain (i.e. it should represent the entities and its relationships but it should not represent processes);

.5 should not contain details on the physical representation of its entities; however, it could be used to guide the development of the necessary databases and interfaces; and

.6 should be flexible and extendable for meeting future requirements (i.e. new entities could be added by any stakeholder through a process known as registration).

3.13 Figure 2 illustrates how the proposed CMDS would influence the components of the e-navigation architecture (see paragraph 3.6.1 above) when creating hardware and software used for e-navigation purposes.

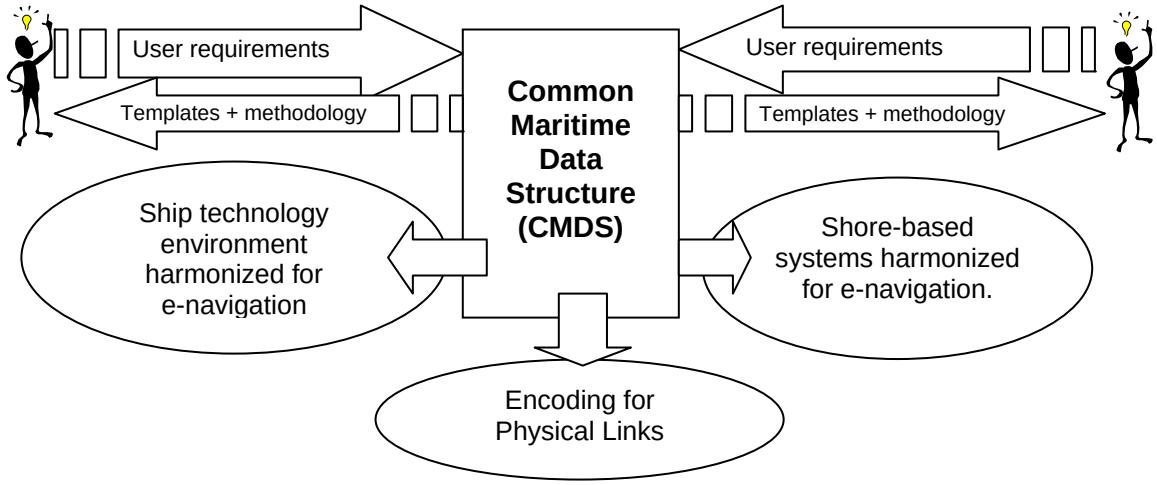


Figure 2: Scope and impact of the CMDS

3.14 The Sub-Committee was invited to agree on the correspondence group's proposed way forward for developing the CMDS and invite the Committee to approve this approach.

Using IHO's S-100 standard as the baseline for creating a framework for data access and services under the scope of SOLAS

3.15 The Group noted that the S-100 standard developed by IHO could support a variety of hydrographic-related digital data sources, products and customers, including the use of imagery and gridded data, enhanced metadata specifications, unlimited encoding formats and a more flexible maintenance regime. The S-100 standard was fully aligned with mainstream international geospatial standards, in particular the ISO 19100 series of geographic standards, thereby enabling the easier integration of hydrographic data and applications into geospatial solutions.

3.16 The S-100 standard was designed to be extensible and future requirements such as 3-D, time-varying data (x, y, z, and time) and web-based services for acquiring, processing, analysing, accessing, and presenting hydrographic data could be easily added when required.

3.17 The Sub-Committee was invited to agree on the use of the IHO's S-100 standard as the baseline for creating a framework for data access and services under the scope of SOLAS and invite the Committee to approve its use, at its next session.

Establishment of a IMO/IHO Harmonization Group on Data modelling

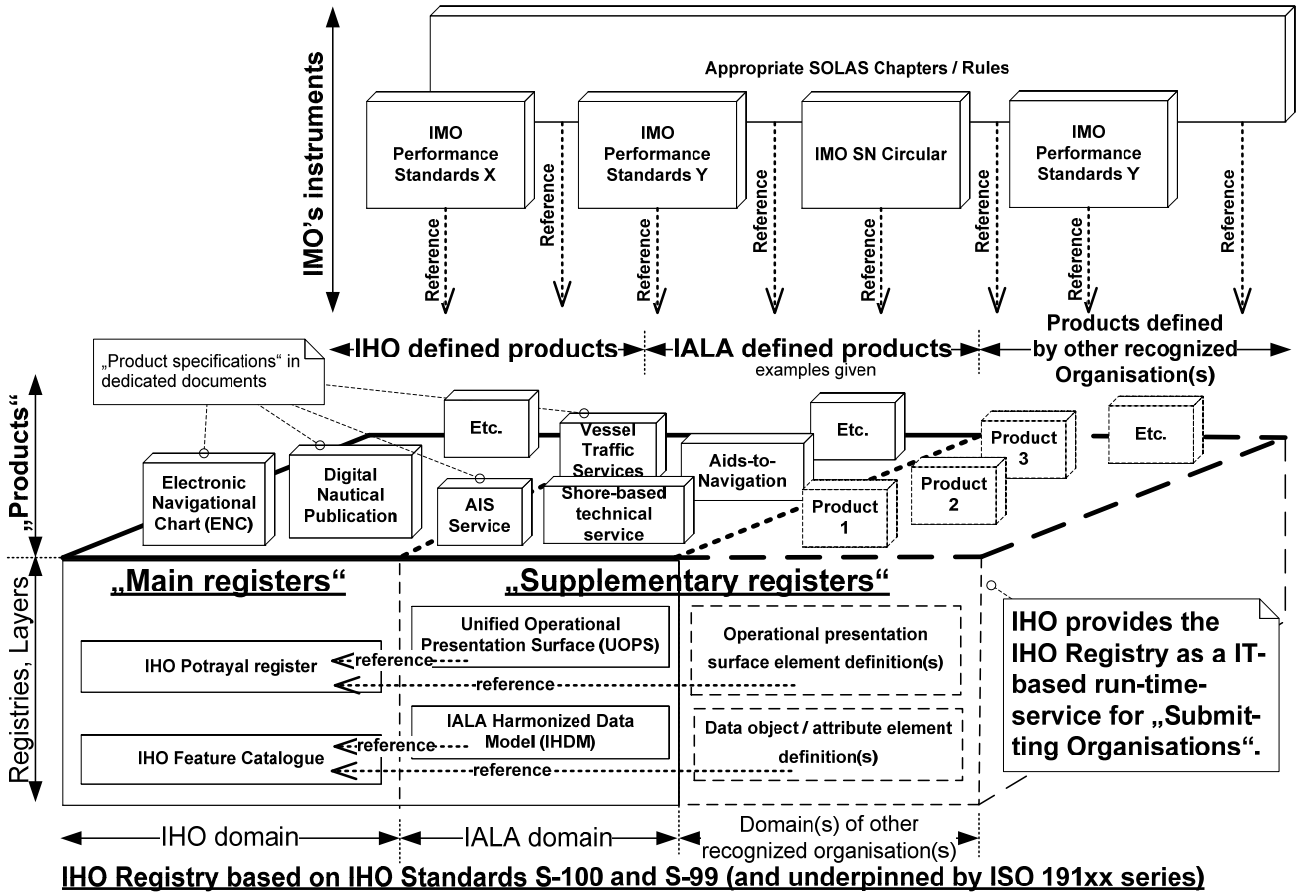
3.18 The Group recognized the need for an IMO/IHO Harmonization Group on Data modelling to be established to consider matters related to the framework for data access and services under the scope of SOLAS and, in this respect, reviewed the draft terms of reference prepared by the correspondence group (NAV 57/6, annex 1).

3.19 The Group requested the Sub-Committee invite the Committee to authorize, in consultation with other organizations, the establishment of an IMO/IHO Harmonization Group on Data modelling under the terms of reference set out in annex 1.

Using the IHO's S-100 Registry for storing defined data objects

3.20 The Group noted with appreciation that IHO and IALA were exploring the possibilities of using the IHO's S-100 Registry, operated by IHO, for storing defined data objects.

3.21 Figure 3 provides a revised representation of the IHO's S-100 Registry.



Note 1: The IHO Registry (based on S-100/S-99) is capable of supporting additional recognized organisations, other than and in addition to IHO and IALA, such as IEC, ISO, etc. This is indicated by „recognised organisation(s)".
Note 2: The „references" introduced between the registries and layers of the „main register" and the „supplementary registers" are provided as examples, only, for simplicity's sake. There could be, by default, „references" between any registry of any international organisation, provided they are of the same kind (i. e. features/attributes or portrayal elements).

Figure 3: Representation of the IHO's S-100 Registry, as revised

3.22 The Group considered that the use of the IHO's S-100 Registry would be flexible and extendable for meeting future requirements.

3.23 The Group noted that the IHO's S-100 Registry allowed the addition of new entities by any stakeholder through a process known as registration. Once registered, the new entity would be available to all stakeholders through an open and public access. Stakeholders might be designated as a domain owner within the IHO's S-100 Registry with full control over its contents and derived standards.

3.24 The Group recommended inviting IHO and IALA to continue reporting on progress made to the correspondence group and the IMO/IHO Harmonization Group on Data modelling, in case they were established.

Development of Maritime Service Portfolios (MSPs)

3.25 The Group considered the information provided by the correspondence group and noted that, in particular, an 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. Hence, a "Maritime Service Portfolio" might also be construed as a set of "products" provided by a stakeholder in a given sea area, waterway, or port, as appropriate.

3.26 The Group recalled that the user needs with regard to the e-navigation concept had identified and adopted different MSPs corresponding to needs for services and communication in different areas and for different operations, and it had been agreed that the areas could be divided into:

.1 harbour operations;

.2 operations in coastal and confined or restricted waters;

.3 transocean voyages;

.4 offshore operations; and

.5 operations in Arctic, Antarctic and remote areas.

Examples of such possible services might be local warnings, ice conditions, ENC updates, real-time tidal information, etc.

3.27 Integrated shipboard systems were a key shipboard platform that would fulfil the requirement for the "shipboard equipment supporting e-navigation", and further development of systems such as Integrated Navigation System (INS) or Integrated Bridge System (IBS) might be examples to that end.

3.28 The Group recognized the need to further develop MSPs to achieve harmonization, modernization, integration and simplification onboard and ashore.

3.29 The Group was of the opinion that the development of MSPs should be scalable and could be performed with the support of shore-side organizations, such as IALA or IHO.

3.30 The Group invited the Sub-Committee to note the above comments and agree with the further development of MSPs.

Gap analysis

3.31 The Group reviewed the gap analysis prepared by the correspondence group (NAV 57/6, annex 2) along with the information provided in documents NAV 57/6/2, NAV 57/6/3 and NAV/INF.4 (Republic of Korea), NAV 57/6/4 (IALA), NAV 57/6/6 (United Kingdom) and NAV 57/6/7 (Australia).

3.32 The Group noted that GNSS was considered as the primary system for navigation and positioning; however, the need was identified for having a non-space-based backup system. In this respect, several options or alternatives to facilitate resilience and backup were promoted, including, but not limited to, the use of AtoNs, radar, pilot service, VTS, eLoran and INS.

3.33 The Group was of the opinion that, in order to assess the requirements for resilient Position, Navigation and Timing (PNT) and suitable backup system, a proper analysis of the requirements for resilient PNT in terms of accuracy, validity, reliability and availability would be required. In particular, the requirements for timing should be carefully considered. In fact, maintaining a high precision of timing might not be necessary for e-navigation into the foreseeable future. This might considerably simplify the backup arrangements needed for periods when GNSS performance was degraded.

3.34 It was noted that the only foreseeable e-navigation need for ultra-accurate timing could be for the transmission and reception of AIS messages. However, it was further noted that AIS already had a mode of operation that did not need accurate timing on board. If the performance degradation of AIS that results from using this mode was to be acceptable during periods of GNSS unavailability, there appeared to be no other onboard requirements for precision time in excess of that which could be given by existing cost effective technology.

3.35 The Group noted the information provided above and recommended forwarding this, together with the information contained in documents NAV 57/6/2, NAV 57/6/3 and NAV/INF.4 (Republic of Korea), NAV 57/6/4 (IALA), NAV 57/6/6 (United Kingdom) and NAV 57/6/7 (Australia), to the correspondence group for further consideration during the ongoing process of the gap analysis, as well as during the cost-benefit and risk analysis.

3.36 The Group further reviewed the information contained in the gap analysis prepared by the correspondence group and provided comments and observations which were duly noted by its coordinator.

3.37 The Group noted with appreciation the significant progress made by the Republic of Korea on filling and completing the gap analysis and invited them to submit this information to the correspondence group for further consideration.

3.38 The Group also noted that the initial completed gap analysis was expected to be distributed to all members of the correspondence group during August 2011 for consideration, comments and observations.

3.39 The Group further noted that the results of the gap analysis would be the basis for further discussions on cost benefit and risk analysis and recommended encouraging the participation of Member States, organizations and interested parties in its preparation.

3.40 The Group invited the Sub-Committee to note the progress made on the development of the gap analysis and recommended instructing the correspondence group to further develop the gap analysis with a view to finalization at NAV 58.

Strategy implementation plan

3.41 The Group noted the information provided in documents NAV 57/6/5, NAV 57/INF.7 and NAV 57/INF.8 (JAPAN) and concurred with the view that the development of guidelines for usability evaluation of navigational equipment should continue during the preparation of the strategy implementation plan.

3.42 In considering the use of the modular concept to enable scalability and implementation, the Group was of the view that INS could be considered to be the dominant factor for the development of e-navigation on board providing a task-oriented approach and offering the possibility to integrate further functionality specified within the e-navigation process.

3.43 The Group noted that the preparation of performance standards using overarching approach was an issue that should be further discussed by the correspondence group.

3.44 The Group noted the information provided by some delegations regarding national or regional developments on e-navigation as well as on the different sources of funding available and recommended encouraging Member States, organizations and other parties to inform and share the results of regional developments, conferences, workshops and testbeds.

3.45 Regarding the consideration of user needs, the Group was of the view that its final validation could only be obtained by means of conducting trials in the real world, although some functions could be validated only by simulation.

3.46 The Group noted that the e-navigation implementation plan would be the invaluable asset to facilitate the advancement of maritime field by integrating the existing and new technologies, especially IT technologies. Through the implementation process of e-navigation, various systems and services would be expected to be developed, integrated, harmonized, modernized and simplified in the near future. To make them stable and complete, the reliability would have to be confirmed during the gap analysis.

3.47 The Sub-Committee was invited to note the above preliminary comments provided by the Group on the draft outline of a strategy implementation plan prepared by the correspondence group.

4 UTILIZATION OF THE 495-505 KHZ BAND BY THE MARITIME MOBILE SERVICE FOR THE DIGITAL BROADCASTING OF SAFETY AND SECURITY RELATED INFORMATION FROM SHORE-TO-SHIPS

4.1 The Group considered the information provided in document NAV 57/5/1 (Secretariat) related to a new ITU-R report (M.2201 11/2010) on the Utilization of the 495-505 kHz band by the maritime mobile service for the digital broadcasting of safety and security related information from shore-to-ships.

4.2 The Group noted that the report provided a technical approach allowing the use of the 500 kHz band for digital broadcasting of maritime safety and security related information for the benefit of ships at sea, which could co-exist with the worldwide NAVTEX system.

4.3 It was also noted that the frequency band of 495-505 kHz was ideally suited to broadcast from shore to ship. The surface wave propagation of a coast station using this band could provide a coverage area from the coast of 400 nautical miles off shore (same as the NAVTEX system).

4.4 Acknowledging the current difficulties for frequency allocation and taking into account the further expected needs of additional frequency spectrum, the Group was of the opinion that frequency band of 495-505 kHz should be claimed for future uses of e-navigation.

4.5 The Sub-committee was invited to consider the allocation of the frequency band of 495-505 kHz for future uses of e-navigation and take action as appropriate.

5 OVERALL PLANNING 2012–2014 STRATEGY IMPLEMENTATION PLAN

5.1 The Group reviewed the joint plan of work for the COMSAR, NAV and STW Sub-Committees for the period 2009–2012 (MSC 86/23/4, annex, page 7) and prepared a proposed joint plan of work for the COMSAR, NAV and STW Sub-Committees for the period 2012-2014, as set out in annex 2.

5.2 The Sub-Committee was invited to agree with the proposed joint plan of work for the COMSAR, NAV and STW Sub-Committees for the period 2012-2014 and forward it to the Committee for approval, at its next session.

5.3 The Sub-Committee was further invited to consider extending the target completion date for the work programme item “Development of an e-navigation strategy implementation plan” to 2014.

6 RE-ESTABLISHMENT OF THE CORRESPONDENCE GROUP ON E-NAVIGATION

6.1 In light of the discussions set out in sections 3 to 5, the Group developed the terms of reference for a correspondence group to progress the work intersessionally under the coordination of Norway[1], as set out in annex 3, and invited the Sub-Committee to re-establish the correspondence group on e-navigation and approve its terms of reference.

7 ANY OTHER BUSINESS

7.1 The delegation of the Islamic Republic of Iran, whilst supporting any kind of innovations that could help enhancement of maritime safety and security, was of the view that e-navigation was an innovation which was expected to have valuable effect in this regard. It was known that, the technologies for such innovation were important and crucial and were considered as a pre-requirement for fulfilling the obligations stipulated in the relevant instruments. The delegation of the Islamic Republic of Iran expressed its deep concern with regard to safety affected by some unfair treatments and restrictions in providing safety equipments or facilities which was totally unacceptable and against the spirit of IMO goals as well as peaceful international maritime transportation. According to the above-mentioned issue, the delegation of the Islamic Republic of Iran strongly believed that the maritime safety, security and marine environment protection shall not be affected at any time and in any case by such unfair treatments.

[1] **Coordinator**:
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8 ACTION REQUESTED OF THE SUB-COMMITTEE

8.1 The Sub-Committee is invited to:

.1 agree on the current overarching e-navigation architecture and forward it to MSC 90 for approval (paragraph 3.9 and figure 1);

.2 agree on the correspondence group's proposed way forward for developing a Common Maritime Data Structure (CMDS) and invite MSC 90 to approve this approach (paragraph 3.14 and figure 2);

.3 agree on the use of the IHO's S-100 standard as the baseline for creating a framework for data access and services under the scope of SOLAS and invite MSC 90 to approve its use (paragraph 3.17);

.4 invite the Committee to authorize, in consultation with other organizations, the establishment of an IMO/IHO Harmonization Group on Data modelling (paragraph 3.19 and annex 1);

.5 invite IHO and IALA to continue reporting on the use of the IHO's S-100 Registry, operated by IHO, for storing the defined data objects, to the correspondence group and the IMO/IHO Harmonization Group on Data modelling, if established (paragraph 3.24);

.6 note the comments of the Group regarding Maritime Service Portfolios (MSPs) and agree with their further development (paragraphs 3.25 to 3.30);

.7 note the progress made on the development of the gap analysis and encourage the participation of Member States, international organizations and interested parties in its preparation (paragraphs 3.31 to 3.40);

.8 note the preliminary comments provided by the Group regarding the draft outline of a Strategy Implementation Plan on e-navigation and encourage Member States, international organizations and other parties to advise on and share the results of relevant regional developments, conferences, workshops and testbeds related to e-navigation (paragraphs 3.41 to 3.47);

.9 consider the allocation of the frequency band of 495-505 kHz for e-navigation and take action, as appropriate (paragraph 4.5);

.10 agree the proposed joint plan of work for the COMSAR, NAV and STW Sub-Committees for the period 2012-2014 and forward it to MSC 90 for approval (paragraph 5.2 and annex 2);

.11 invite MSC 90 to extend the target completion date for the work programme item “Development of an e-navigation strategy implementation plan to 2014” (paragraph 5.3);

.12 re-establish the correspondence group on e-navigation (paragraph 6.1 and annex 3); and

.13 approve the report, in general.

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ANNEX 1

DRAFT TERMS OF REFERENCE FOR THE IMO/IHO HARMONIZATION GROUP ON DATA MODELLING (HGDM)

1 In creating an e-navigation architecture, it is important to identify information and data flows, and the interactions between applications and user interfaces. Consequently, there needs to be a data structure to optimize the use, interoperability, flow and accessibility of relevant information and data within the maritime domain (including both ship and shore aspects). It is therefore important to harmonize efforts in data modelling, with the aim of creating and maintaining a robust and extendable maritime data structure. This maritime information and data structure will require some form of overarching coordination to ensure the ongoing management and maintenance of the structure.

2 There may be several management roles to be performed by such a coordinating body, (for example, the maintenance of registries and the development and adoption of product specifications). This management role may be shared between relevant organizations. The structure is a highly important element by which e-navigation can modernize the operational environment of the maritime industry and also fulfil the requirement of document MSC 85/26, annex 20.

3 The HGDM should be constituted of representatives of IMO and IHO Member States and Secretariats, and organizations with an official IMO/IHO observer status.

4 The HGDM should be chaired by an IMO Member State and supported by the Secretariat of the IMO.

5 The HGDM reports to the IMO Sub-Committee on Safety of Navigation (NAV), and to the IHO through the IHB Directing Committee, as appropriate.

6 The HGDM should:

.1 as requested by the IMO or the IHO, consider matters related to the framework for data access and information services under the scope of SOLAS, using as a baseline IHO's S-100 standard, with a view to harmonize and standardize:

.1 formats for the collection, exchange and distribution of data;

.2 processes and procedures for the collection; and

.3 development of open standard interfaces; and

.2 review the results of studies by the IMO, the IHO and other related organizations which address aspects of access to information services under the scope of SOLAS, and advise the IMO and the IHO as to whether they are compatible with the e-navigation concept taking into account the identified user needs as they exist at the time.

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ANNEX 2

A COORDINATED APPROACH TO THE IMPLEMENTATION OF THE E-NAVIGATION STRATEGY

Proposed joint plan of work for the COMSAR, NAV and STW Sub-Committees for the period 2012-2014

<table>
<tr><th colspan="14">A COORDINATED APPROACH TO THE IMPLEMENTATION OF IMO'S E-NAVIGATION STRATEGY
OVERALL PLANNING 2012-2014 BY STRATEGY ELEMENT</th></tr>
<tr><th></th><th colspan="5">2012</th><th colspan="4">2013</th><th colspan="5">2014</th></tr>
<tr><th>Meetings</th><th>COMSAR 16</th><th>STW 43</th><th>MSC 90</th><th>NAV 58</th><th>MSC 91</th><th>COMSAR 17</th><th>STW 44</th><th>MSC 92</th><th>NAV 59</th><th>COMSAR 18</th><th>STW 45</th><th>MSC 93</th><th>NAV 60</th><th>MSC 94</th></tr>
<tr><td>USER NEEDS</td><td></td><td></td><td rowspan="6"></td><td></td><td rowspan="6"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Overarching Architecture</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Gap analysis</td><td colspan="2" rowspan="2">Correspondence Group</td><td>final</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>C-B and risk analysis</td><td></td><td colspan="3">Correspondence Group</td><td></td><td>final</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Strategy Implementation Plan</td><td colspan="2">2012: Intersessional WG (to be decided)</td><td>updated outline</td><td></td><td colspan="3">2013 Intersessional WG (to be decided)</td><td>updated outline</td><td colspan="2">Correspondence Group</td><td></td><td>final</td><td>adoption</td></tr>
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ANNEX 3

DRAFT TERMS OF REFERENCE FOR THE CORRESPONDENCE GROUP

Taking into account the joint plan of work for the COMSAR, NAV and STW Sub-Committees for the period 2012–2014, the comments and general views expressed at NAV 57 and, decisions taken by NAV 52 including the guidance in MSC/Circ.1091 on Issues to be considered when introducing new technology on board ship and MSC/Circ.878-MEPC/Circ.346 on Human Element Analysing Process (HEAP); the Correspondence Group on e-navigation should:

.1 using the overarching e-navigation architecture as a framework, further develop the detailed architecture of both the ship and shore sides, as appropriate, taking into account the outcomes of the gap analysis;

.2 consider the development of Maritime Service Portfolios to achieve harmonization, modernization, integration and simplification on board and ashore, taking into account the use of the IHO's S-100 standard, and recommend the approach to be taken;

.3 further develop and complete the gap analysis with a view to finalization at NAV 58, taking into account the relevant documents submitted in this respect;

.4 further develop the draft Strategy Implementation Plan;

.5 consider the development of guidelines for usability evaluation of navigational equipment during the preparation of the Strategy Implementation Plan, taking into account the information provided in documents NAV 57/6/5, NAV 57/INF.7 and NAV 57/INF.8 (Japan) and NAV 57/WP.[...], and recommend the approach to be taken;

.6 further progress the preparation of cost benefit and risk analysis processes;

.7 submit reports to COMSAR 16 and STW 43 raising specific questions, if required, that should be addressed by the STW and COMSAR Sub-Committees; and

.8 submit a consolidated progress report to NAV 58.