S-124 Progress

Report of the S100 Navigational Warning Correspondence Group (S100NW CG)

Submitted by:	Chairman, S100NW CG
Related Documents:	IMO Background Related to the Development of E-Navigation (S100NW CG web pages).
Related Projects:	E-navigation, MSI Maritime Service Portfolio, Modernization of GMDSS.

Chair:	Yves Le Franc, France
Vice-Chair:	/
Secretary:	/
Member States:	Australia, France, Greece, Japan, New-Zealand, Norway, Sweden, United-Kingdom, United States.
Expert Contributor Organisations:	CIRM, Danish Maritime Authority (DMA).
	see http://www.iho.int/mtg_docs/com_wg/CPRNW/S100_NWG/Membership.pdf for full details

Activities during the reporting period

The WWNWS 5 decided to establish the S100NW Correspondence Group lead by France.
Australia, Greece, Japan, New-Zealand, Norway, Sweden, United-Kingdom, United States joined the Group.

Thanks to the BHI, S100NW CG web pages were created under the WWNWS main page.
The draft TOR were written in December 2013. A slightly modified version is submitted to the approval of WWNWS 6 (see Draft V0.3 – July 16th 2014 in Annexe 1). During its 5th meeting, the HSSC assigned the identifier S-124 to the S-100 Product Specification (PS) for NW. Accordingly, it is proposed to change the name of the CG for a better visibility.

The CG has to submit a draft of S-124 to the endorsement by WWNWS and HSSC. This PS must allow the development of solutions, by the operators and by the industry, which meet the needs and the gaps on ships and in organizations on shore, in compliance with the architecture of the e-navigation such as defined by the IMO.

An overview of tasks was drawn up (December 2013).

The CIRM and Danish Maritime Authority (DMA) joined in February 2014. DMA which is very involved in e-navigation, brought to the CG an advanced draft S-100 model for NW issued from ACCSEAS project[1]. This initial model will be reviewed and improved within the CG.

A paper "IMO Background Related to the Development of E-Navigation" was prepared and published in March 2014 with the associated documents[2] on the S100NW CG web page for consideration of e-navigation key elements by the members of the CG.

[1] This model was presented earlier to an IALA workshop on S-100 Product Specifications (June 2013)
[2] Users needs, gap analysis, overarching e-navigation architecture, potential e-navigation solutions, risk control options, Maritime Service Portfolios…

The development of S-124 participates decisively in the response to several strong e-navigation's needs and gaps. It is in accordance with the prioritized solutions S4 *integration and presentation of available information in graphical displays received via communication equipment* and S9 *improved communication of VTS service portfolio (Not limited to VTS stations)*. It contributes to the risk control option (RCO) 6 *improved shore-based services* and to the RCO 1 *integration of navigation information and equipment including improved software quality assurance.* It is in the scope of tasks T13, T14 and T17 of the Strategy Implementation Plan (SIP – see Annex 2) submitted to the endorsement of IMO NCSR 1 (30 June to 4 July 2014).

Some work has been done to establish the method to follow in the S-100 modeling of NW. The method adopted is based on use case diagram (see Annex 3) to identify actors, their roles, their needs and the current gaps. This will be used to design and validate the S-100 model (UML) for NW. This method allows linking the actors' point of views and the S-100 NW model with the solutions envisaged.

The CG is reviewing (July 2014) the needs and gaps for each actor on the basis of the elements of the IMO e-navigation background.

Way ahead

The group's work will continue schematically on the following topics:

- Consider the background of the modernization of the GMDSS (COMSAR and NCSR documents).
- Identify basic functions that should or could apply to digital NW (onshore and aboard) in accordance with new ways of operations (see § New ways of operations).
- Review and improve the initial model provided by DMA (using UML and other S-100 concepts)
    - to ensure that the content of the current NW (S-53) is supported
    - to meet functions' requirements.
- These functions could be the basis for new draft performances standards issued by IMO in relation with other relevant organizations.
- Define de portrayal of the NW in relation other relevant organizations.
- When the draft S-124 will be mature enough, proceed to a test-bed to refine it and to prove its technical value before approval and implementation.
- Reach a consensus on the project of S-124
    - by demonstrating its contribution to the development of solutions
    - by assessing the impact on the stakeholders (IHO and no IHO).
- Enlarge as appropriate the membership and relationships with other entities.
- Submit S-124 PS for endorsement.

The work is conducted on an iterative process between items and by successive rounds within the group and in exchanges with other entities. The tentative schedule in Annex 4 gives the approximate periods during which the work focuses on the different items.

Specific points to be considered at this stage

- *New ways of operations*

Standardized digital NW, as other new technical components, will allow new ways of operations. The main objective is of course the presentation of NW on the ship's navigation display, but other effective changes in the production, the communication and dissemination, the use, the management and the storage are possible, onshore and aboard. The combination of the different means to provide the nautical information (e.g. NW and Notice and Mariners) could be reviewed as a new global information system. The design of the S-124 data model depends to a certain extent of the operations envisaged (and of other technical components).
The development of new ways of operations is in the scope of the modernization of the GMDSS via the e-navigation while the task T17 of the e-navigation's SIP supposes to define the Maritime Service Portfolios[3]

[3] MSPs have been identified as the means of providing electronic information in a harmonized way.

(MSPs) including the MSI MSP. It is expected that WWNWS should be greatly involved and we can assume that MSI will be one of the first areas of implementation of e-navigation (see also document HSSC5-05.1D (5 & 6)).

The definition of the operations within MSI MSP is not in the mandate of the S-124 CG which is to develop a S100 data model for NW. So, the S-124 CG and the WWNWS will have to exchange since the S-124 CG will need some guidance on operations envisaged and on the associated scenario of transition for a worldwide implementation.

- *Modelling of Preliminary and Temporary Notices to Mariners*

A question appears within the CG and even if the CG hasn't yet decided of its preference, it illustrates the topic of the new ways of operations.
NWs and T&P NMs contain similar information; both NWs and T&P NMs should be displayed on the ECDIS and often a T&P NM relays a NW via another media[4] (i.e. the slower flow of charts updates). The two concepts contribute to the same user need for safety related information, then, they should be examined together to obtain a harmonized service of nautical information. Issues such as the usefulness of some T&P NMs when NWs will be stored aboard and displayed with the chart should be examined.
So, it might be useful that the S-124 CG also models T&P NMs (with a lower priority).

Action Required of WWNWS
The WWNWS is invited to:

a. note the report
b. approve the proposed TOR in Annex 1
c. advise the group as appropriate.

[4] IHO recommends converting paper charts T&P NMs in ENC updates (ER) but it is a heavy task for HOs and the temporary or preliminary aspect of the information isn't well reflected when using ER.

Draft Terms of Reference – Version 0.3 – July 16th 2014

S-124 CORRESPONDENCE GROUP (S-124 CG)

Terms of Reference

Ref:
1/ 5th WWNWS Meeting (Monaco, October 2013)
2/ 5th HSSC Meeting (Shanghaï, November 2013)

1. Objective

To develop an S-100 Product Specification and its component Feature and Portrayal Catalogues for Navigational Warning to improve dissemination and integration within bridge systems and shore systems via a digital format. The Product Specification is expected to contribute to the technical infrastructure of the e-navigation as designed by IMO and to the renewal of the Global Maritime Distress and Safety Systems (GMDSS). The identifier of this Product Specification is S-124 (ref. 2/).

2. Authority

The S-124 CG is a subsidiary of the World-Wide Navigational Warning Service Sub-Committee (WWNWS) of IRCC.

3. Procedures

a. The CG shall:

- identify a work program, including expected time frame
- review the needs and requirements
- model NW in compliance with S-100 standard and emerging e-navigation architecture
- test to demonstrate the solution of S-100 modelling
- propose the S-124 product specification and associated documents

b. The CG works by correspondence. Internet will be the normal method of communication. Papers and information material will be posted on a specific WWNWS section of the IHO web-site, on behalf of the CG leader.

c. The CG should liaise with the S-100 WG of the HSSC (ref. 2/).

d. The CG will liaise with other international and IHO bodies, as appropriate.

e. Decisions should generally be made by consensus. If votes are required on issues or to endorse proposals, only Member States (MS) may cast a vote. Votes shall be on the basis of one vote per MS represented.

f. The CG submits and reports at least annually or as appropriate to WWNWS. The CG informs HSSC. The final draft of the product specification should be submitted by WWNWS to HSSC for endorsement.

4. Composition

a. Membership of the CG is open to all IHO Member States wishing to participate.

b. Accredited Non-Governmental International Organizations Observers may participate in CG activities.

c. Expert Contributor membership is open to entities and organizations that can provide a relevant and constructive contribution to the work of the WG.

d. Expert Contributors shall seek approval of membership from the leader.

e. Expert Contributor membership may be withdrawn in the event that a majority of the MS represented in the CG agrees that an Expert Contributor's continued participation is irrelevant or unconstructive to the work of the CG.

f. The leader of the CG is appointed by the WWNWS. At the creation of the CG, the leader is a representative from France.

Annex 2

Extract from the e-navigation Strategy Implementation Plan (SIP) - Ref. NCSR 1-9

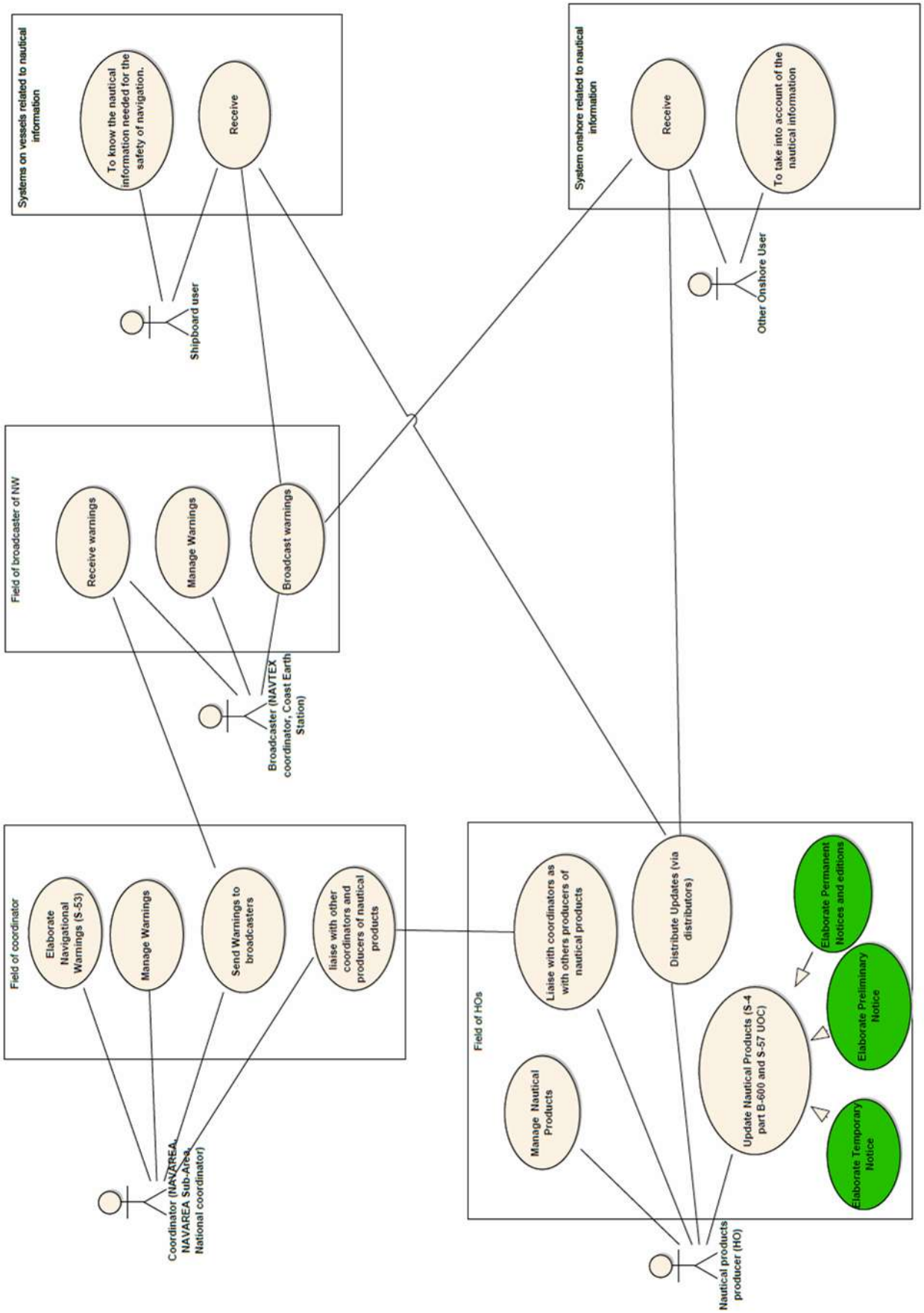
Table 7
Tasks, expected deliverables, transition arrangements and implementation schedule

Task No	Task	Expected Deliverable	Transition Arrangements	Prioritized Implementation Schedule
T1	Development of Draft Guidelines on Human Centred Design (HCD) for e-navigation systems.	Guidelines on Human Centred Design (HCD) for e-navigational systems.	None	2014/2015
T2	Development of Draft Guidelines on Usability Testing, Evaluation and Assessment (UTEA) of e-navigation systems.	Guidelines on Usability Testing, Evaluation and Assessment (UTEA) of e-navigation systems.	None	2014/2015
T3	Develop the concept of electronic manuals and harmonize the layout to provide mariner with an easy way of familiarization for relevant equipment.	Guidelines on electronic equipment manuals.	Provide existing manuals as .pdf	2019
T4	Formulate the concept of standardized modes of operation, including store and recall for various situations, as well as S-mode functionality on relevant equipment.	Guidelines on S-mode.	None	2017
T5	Investigate whether and extension of existing Bridge Alert management Performance Standards (PS) is necessary. Adapt all other alert relevant PSs to the to Bridge Alert management PS.	(a) Guidelines on implementation of Bridge Alert Management. (b) Revised Performance Standards on BAM.	None None	2016 2019
T6	Develop a methodology of how accuracy and reliability of navigation equipment may be displayed. This includes a harmonized display system.	Guidelines on the display of accuracy and reliability of navigation equipment.	None	2017
T7	Investigate if an INS as defined by resolution MSC.252(83) is the right integrator and display of navigation information for e-navigation and identify the modifications it will need, including a communications port and a PNT module. If necessary, prepare a draft revised performance standard. Refer to resolution MSC.191(79) and SN/Circ.243.	(a) Report on the suitability of INS. (b) New or additional modules for the Performance Standards for INS.	None None	2016 2019
T8	Member States to agree on standardized format guideline for ship reporting so as to enable "single window" worldwide (SOLAS regulation V/28, resolution A.851(20) and SN.1/Circ.289).	Updated Guidelines on single window reporting.	National/Regional Arrangements	2019
T9	Investigate the best way to automate the collection of internal ship data for reporting including static and dynamic information.	Technical Report on the automated collection of internal ship data for reporting.	None	2016
T10	Investigate the general requirements resolution A.694(17) and IEC 60945 to see how Built In Integrity Testing (BIIT) can be incorporated.	(a) Revised Resolution on the general requirements including Built In Integrity Testing. (b) Revised IEC Standard on General Requirements including Built In Integrity Testing.	None None	2017 2019
T11	Development of Draft Guidelines for Software Quality Assurance (SQA) in e-navigation. This task should include an investigation into the type approval process to ensure that software lifetime assurance (software updates) can be carried out without major re-approval and consequential additional costs. Refer to SN/Circ.266/Rev.1 and MSC.1/Circ.1389.	Guidelines for Software Quality Assurance (SQA) in e-navigation.	None	2014/2015
T12	Develop guidelines on how to improve reliability and resilience of onboard PNT systems by integration with external systems. Liaise with Administrations to ensure that relevant shore-based systems will be available.	Guidelines on how to improve reliability and resilience of onboard PNT systems by integration with external systems.	None	2016
T13	Develop guidelines showing how navigation information received by communications equipment can be displayed in a harmonized way and what equipment functionality is necessary.	Guidelines on the harmonized display of navigation information received from communications equipment.	None	2019

T14	Develop a Common Maritime Data Structure and include parameters for priority, source, and ownership of information based on the IHO S-100 data model. Harmonization will be required for both use on shore and use on the ship and the two must be coordinated (Two Domains). Develop further the standardized interfaces for data exchange used on board (IEC 61162 series) to support transfer of information from communication equipment to navigational systems (INS) including appropriate firewalls (IEC 61162- 450 and 460).	(a) Guidelines on a Common Maritime Data Structure. (b) Further develop the IEC standards for data exchange used onboard including firewalls.	None Use latest IEC standards	2017 2019
T15	Identify and draft guidelines on seamless integration of all currently available communications infrastructure and how they can be used (e.g. range, bandwidth etc.) and what systems are being developed (e.g. maritime cloud) and could be used for e-navigation. The task should look at short range systems such as VHF, 4G and 5G as well as HF and satellite systems taking into account the 6 areas defined for the MSPs.	Guidelines on seamless integration of all currently available communications infrastructure and how they can be used and what future systems are being developed along with the revised GMDSS.	Use existing onboard communications infrastructure	2019
T16	Investigate how the Harmonization of conventions and regulations for navigation and communication equipment would be best carried out. Consideration should be given to an all-encompassing e-navigation performance standard containing all the changes necessary rather than revising over 30 existing performance standards.	Report on the Harmonization of conventions and regulations for navigation and communication equipment would be best carried out.	None	2017
T17	Further develop the MSPs to refine services and responsibilities ahead of implementing transition arrangements.	Resolution on Maritime Service Portfolios.	National/Regional Arrangements	2019
T18	Development of Draft Guidelines for the Harmonization of test beds reporting.	Guidelines for the Harmonization of test beds reporting.	None	2014/2015

Annex 3

Nautical information use case diagram



Annex 4

Tentative schedule

Work Item	Date start	Date end	Comment
Define a work program			An overview of tasks was drawn up (December 2013). Refine the work program is a permanent task
Review needs, gaps and requirements	Feb. 2014	Nov. 2014	From e-navigation background: on going. From GMDSS' modernization: Sept 2014 – Nov 2014
Identify basic functions	Dec. 2014	Dec. 2015	Aboard functions have priority. In relation with WWNWS for the new ways of operations and the scenario of the transition
Improve UML model	Feb. 2015	Dec. 2015	
Define de portrayal of the NW	Sep. 2015	Jul. 2016	
Tests	2015	2017	
Contribute to draft performances standards	2016	2017	
Enlarge as appropriate the membership and relationships	2014	2017	So that other projects feed us of their ideas and find a normative outlet in them works, to validate functions by actors, to feed other works of other bodies, to reach a consensus, …
Reach a consensus (impact on stakeholders,…)	2016	2017	
Submit S124 for endorsement		2017	