**Preliminary draft structure of the Strategic Implementation Plan (SIP)**

**1 Introduction**

**2 The development of e-navigation**

**3 Strategic Plan for the implementation of the five prioritized solutions and the seven corresponding RCOs**

**3.1 General**

**3.2 Identified RCOs**

**3.3 Framework for the implementation of identified RCOs**

**3.4 Roadmap of actions and timeline for implementation**

**4 The future development of e-navigation**

**4.1 The continual assessment of new user needs**

**4.2 Proposals for a systematic assessment of how new technology can best meet defined and evolving user needs**

**4.3 Possible use of additional and/or alternative analysis FSA.**

**4.4 Plan for the development of any technology and institutional arrangements necessary to fulfil the requirements of e-navigation in the longer term**

**1 Introduction**

This document outlines …

**2 The development of e-navigation**

* Reference to first proposals submitted by the UK and supported by other Member States (document …)
* Reference to the Strategy for the development and implementation of e-navigation and the Framework for the implementation process for the e-navigation strategy (MSC 85/26/Add.1, annexes 20 and 21).
* Definition of e-navigation
* Approved user needs (document NAV 56/WP.5/Rev.1, annexes 2 to 5)
* Overarching e-navigation architecture + Common Maritime Data Structure (CMDS) + use of the IHO's S-100 standard;
* Establishment of an IMO/IHO Harmonization Group on Data modelling
* Finalized GAP analysis and approved list of gaps (documents NAV 58/6, annex 2 and NAV 58/14, annex 7);
* Preliminary list of potential e-navigation (document NAV 58/WP.6/Rev.1, annex 2)
* The five prioritized potential e-navigation solutions and criteria used.
* Formal Safety Assessment (FSA) and identified Risk Control Options (RCOs) (document NAV 59/6, annex 1)
* The development of the concept of Maritime Service Portfolio (list of shore-based services – to be further developed as part of S9 and corresponding RCO)
* Development of related guidelines:

.1 draft Guidelines on Human Centred Design (HCD) for navigational equipment and systems;

.2 draft Guidelines on Usability evaluation of navigational equipment;

.3 draft Guidelines for Software Quality Assurance (SQA) in e-navigation; and

.4 draft Guidelines for the Harmonization of test beds reporting.

* IMO responsibilities

**3 Strategic Plan for the implementation of the five prioritized solutions and the seven corresponding RCOs**

**3.1 General**

Note: The SIP will focus on the 5 prioritized potential e-navigation solutions and the 7 identified RCOs.

It should include a general description of the five prioritized potential e-navigation solutions.

The e-navigation solutions S2, S4 and S9 focus on efficient transfer of marine information/data between all appropriate users (ship-ship, ship-shore, shore-ship and shore-shore). Solutions S1 and S3 promote the workable and practical use of the information/data on board. The combination of these solutions ensures a holistic approach to the interaction between shipboard and shore-based users.

Based on the above five prioritized potential e-navigation solutions, seven RCOs have been identified. It should be noted that some of these RCOs could address more than one or part of other solutions at the same time. The relation between each RCO and the corresponding solutions is described below.

**3.2 Identified RCOs**

Note: Each RCO should include, at least:

.1 General description of the RCO (ref. document NAV 59/6, annex 1, section 7.2, + NAV 59/6/5 (Australia)), including solutions which are addressed.

.2 Required regulatory framework and technical requirements for implementation (e.g. PSs to be revised/ developed, technical documents, etc.) (Note: some references to existing documents contained in NAV 59/WP.8, annex to the annex)

.3 Identification of responsibilities to appropriate organizations /parties

.4 Relevant Key enablers (goals and initial actions)

.5 Dependencies, synergies or relations with other identified RCOs.

.6 Required transition arrangements, if necessary.

.7 Possible training requirements to be identified, including changes to existing training regimes

.8 Phased implementation schedule

.9 Identification of potential sources of funding for development and implementation, particularly for developing regions and countries and of actions to secure that funding, including resource management for development, implementation and operation, as applicable.

**3.2.1 RCO 1: integration of navigation information and equipment including improved software quality assurance (assumed to be shipboard only)**

1. General description of the RCO (ref. document NAV 59/6, annex 1, section 7.2, + NAV 59/6/5 (Australia)), including solutions which are addressed.

.2 Required regulatory framework and technical requirements for implementation (e.g. PSs to be revised/ developed, technical documents, etc.) (Note: some references to existing documents contained in NAV 59/WP.8, annex to the annex)

.3 Identification of responsibilities to appropriate organizations /parties

.4 Relevant Key enablers (goals and initial actions)

.5 Dependencies, synergies or relations with other identified RCOs.

.6 Required transition arrangements, if necessary.

.7 Possible training requirements to be identified, including changes to existing training regimes

.8 Phased implementation schedule

.9 Identification of potential sources of funding for development and implementation, particularly for developing regions and countries and of actions to secure that funding, including resource management for development, implementation and operation, as applicable.

**3.2.2 RCO 2: bridge alert management (Shipboard only)**

**3.2.3 RCO 3: standardized mode(s) for navigation equipment (shipboard only)**

.1 General description of the RCO (ref. document NAV 59/6, annex 1, section 7.2, + NAV 59/6/5 (Australia)), including solutions which are addressed.

.2 Required regulatory framework and technical requirements for implementation (e.g. PSs to be revised/ developed, technical documents, etc.) (Note: some references to existing documents contained in NAV 59/WP.8, annex to the annex)

.3 Identification of responsibilities to appropriate organizations /parties

.4 Relevant Key enablers (goals and initial actions)

.5 Dependencies, synergies or relations with other identified RCOs.

.6 Required transition arrangements, if necessary.

.7 Possible training requirements to be identified, including changes to existing training regimes

.8 Phased implementation schedule

.9 Identification of potential sources of funding for development and implementation, particularly for developing regions and countries and of actions to secure that funding, including resource management for development, implementation and operation, as applicable.

**3.2.4 RCO 4: automated and standardized ship-shore reporting**

.1 General description of the RCO (ref. document NAV 59/6, annex 1, section 7.2, + NAV 59/6/5 (Australia)), including solutions which are addressed.

Shore side should be taken into account for the reception of reports.

.2 Required regulatory framework and technical requirements for implementation (e.g. PSs to be revised/ developed, technical documents, etc.) (Note: some references to existing documents contained in NAV 59/WP.8, annex to the annex)

IALA Reference

* Reporting requirements for VTS V-127, V-128?
* Standard Maritime Phrases (being developed)?
* Recommendation (V-127) on Operational Procedure for VTS?

.3 Identification of responsibilities to appropriate organizations /parties

IALA is recognised as the international co-ordination body for VTS operations...

Need to harmonise both shore to ship reporting as well as ship to shore

IALA may have a role in automated and standardized ship-shore reporting and support allied and other services through VTS.

.4 Relevant Key enablers (goals and initial actions)

Shore side must be ready internationally to receive automated ship reports.

Could IALA co-ordinate the shore side standards?

VDES Development

IALA Should consider data modelling and protocol exchange (S-100) IALA Guidelines 1087 & 1088; Product specifications for ship reporting.

.5 Dependencies, synergies or relations with other identified RCOs.

RCO 6 – Improved shore based services - IALA does have a role in relation to MSPs (under development - eNav14-13.2.1)

.6 Required transition arrangements, if necessary.

IALA Should advise members (Guidance document) of best practice for transition from a shore side perspective.

IALA should contribute to the development and provide guidance for the integration of VTS with shore based Single Windows.

.7 Possible training requirements to be identified, including changes to existing training regimes

Consider including automated reporting matters in VTSO training (V103)?

Consider WWA model courses?

.8 Phased implementation schedule

IALA should establish and promulgate guidance for its members – in consultation with the IMO.

.9 Identification of potential sources of funding for development and implementation, particularly for developing regions and countries and of actions to secure that funding, including resource management for development, implementation and operation, as applicable.

IALA may contribute to identifying improved efficiencies and benefits of automated reporting from a shore based perspective to help its members justify upgrades.

**3.2.5 RCO 5: improved reliability and resilience of onboard PNT systems**

.1 General description of the RCO (ref. document NAV 59/6, annex 1, section 7.2, + NAV 59/6/5 (Australia)), including solutions which are addressed.

IALA NAVGUIDE; WWRNP; GNSS Vulnerability (R129)

.2 Required regulatory framework and technical requirements for implementation (e.g. PSs to be revised/ developed, technical documents, etc.) (Note: some references to existing documents contained in NAV 59/WP.8, annex to the annex)

IALA performance requirements for individual systems.

IALA Provides guidance to coastal states (service providers) on compliance with SOLAS V-13

.3 Identification of responsibilities to appropriate organizations /parties

IALA members have the responsibility to comply with SOLAS V-13 with respect to implementation of shore based services as appropriate. IALA advises its members on compliance issues.

.4 Relevant Key enablers (goals and initial actions)

If solutions are identified for terrestrial based, radio or radar transponder systems for resiliency, IALA may need to provide recommendations to its members for implementation.

.5 Dependencies, synergies or relations with other identified RCOs.

Most other RCOs depend upon position.

Terrestrial positioning and augmentation services would be considered as an MSP.

.6 Required transition arrangements, if necessary.

Should a terrestrial PNT system be chosen, IALA may need to assist its members with implementation guidance.

.7 Possible training requirements to be identified, including changes to existing training regimes

WWA AtoN Technician and management training for implementation of new technology or services.

.8 Phased implementation schedule

IALA in consultation with the IMO.

.9 Identification of potential sources of funding for development and implementation, particularly for developing regions and countries and of actions to secure that funding, including resource management for development, implementation and operation, as applicable.

Most likely government funded, however some areas may benefit from IMO Technical Cooperation.

**3.2.6 RCO 6: improved shore-based services**

Note: This should include the set of operational and technical services which will be part of the Maritime Service Portfolios, including their description (ref document NAV 59/6, annex 3, + comments provided at NAV 59). Each MSP should match the corresponding solution. Further work will be addressed in the roadmap of actions.

.1 General description of the RCO (ref. document NAV 59/6, annex 1, section 7.2, + NAV 59/6/5 (Australia)), including solutions which are addressed.

Reference IALA VTS Guide

.2 Required regulatory framework and technical requirements for implementation (e.g. PSs to be revised/ developed, technical documents, etc.) (Note: some references to existing documents contained in NAV 59/WP.8, annex to the annex)

Reference Maritime Radio Communications Plan

.3 Identification of responsibilities to appropriate organizations /parties

IALA should continue to advise its members of the use of communication options for the provision of VTS, AtoN and MSI service information.

IALA may identify new user needs or technology in these fields

IALA should work with other appropriate stakeholders to develop and implement the concept of Maritime Service Portfolios.

.4 Relevant Key enablers (goals and initial actions)

IALA should work with other key stakeholders to identify and secure appropriate frequencies and bandwidth

IALA should develop appropriate Marine Service Portfolios for the services its members deliver

IALA should work with key stakeholders to further develop the harmonised use of the S-100 standard

IALA should work to become a domain owner of relevant fields within the S-100 standard

.5 Dependencies, synergies or relations with other identified RCOs.

RCO1 (integration of information)

RCO4 (Ship / Shore reporting)

RCO5 – Provision of AtoN as an MSP

.6 Required transition arrangements, if necessary.

Transitioning to S-100

Transitioning to any new communication [protocols and] technologies

IALA VTS Guide and Marine Communication Plan will need to keep pace.

.7 Possible training requirements to be identified, including changes to existing training regimes

IALA V-103 and appropriate model courses (such as eNavigation) will to be kept current

.8 Phased implementation schedule

Identification and securing frequencies and bandwidth – note WRC schedules

Transition to S-100 – Note the work of the IMO/IHO Harmonisation Group on Data Modelling

.9 Identification of potential sources of funding for development and implementation, particularly for developing regions and countries and of actions to secure that funding, including resource management for development, implementation and operation, as applicable.

Costs of providing improved services will lie with either the governments as required, or the encouragement of appropriate value added or commercial services.

**3.2.7 RCO 7: bridge and workstation layout standardization (shipboard only)**

**3.3 Framework for the implementation of identified RCOs**

**3.3.1 Relevant description of the ship and shore architecture for the prioritized solutions, including the identified RCOs**

IALA will need to take a leading role in defining and implementing the shore side architecture and collaborate with other stakeholders such as the IMO, IHO, IHMA, IAPH and appropriate non-maritime organisations to ensure international harmonisation.

It is expected that “IALA Recommendation e-NAV-140 on e-Navigation Architecture from a Shore Perspective” will be approved by IALA Council later in 2013, at which time it will be sent to the IMO CG for information and to assist with the SIP.

**3.3.2 Identification and definition of future communication protocols for e-navigation**

IALA will have a coordination role amongst its members to ensure that new communication technologies and protocols are developed within the time scale of IMO & ITU to meet the needs of eNavigation.

IALA will have a leading role to represent its members’ interests to develop certain new communication technologies such as AIS upgrades and VDES.

**3.3.3 Development of related guidelines**

.1 draft Guidelines on Human Centred Design (HCD) for navigational equipment and systems;

IALA should monitor the developments of HCD for shipboard equipment, contribute where necessary to ensure harmonisation and consider applications for shore based equipment.

.2 draft Guidelines on Usability evaluation of navigational equipment;

IALA should monitor the developments of Usability for shipboard equipment, contribute where necessary to ensure harmonisation and consider applications for shore based equipment.

.3 draft Guidelines for Software Quality Assurance (SQA) in e-navigation; and

IALA should monitor the developments of SQA for shipboard equipment and contribute where necessary to ensure ship/shore harmonisation.

IALA will need to address the issue of SQA for shore based systems involved with information management, communication technology and system control for all aspects of members’ VTS and AtoN services.

.4 draft Guidelines for the Harmonization of test beds reporting.

IALA has taken an early lead in drafting guidelines for the reporting of testbeds that will be submitted to the IMO and eNavigation community for consideration.

Note: This should include a general description of the guidelines which are expected to be presented to the CG by Member States concerned and related International Organizations. In case they are not finalized, the further development of the related guidelines could be addressed as part of the roadmap of actions. (Note: Due to the amount of work required, Member States concerned and related International Organizations were encouraged to contribute to their completion as part of the work of the CG (NAV 59/WP.8, paragraph 3.30)).

**3.3.4 Proposals on public relations and promotion of the e-navigation concept to key stakeholder and user groups**

IALA will work with the IMO and other stakeholders to promote the concept, development, implementation and review of eNavigation in the maritime industry.

IALA will provide specific guidance on issues affecting its members in its Recommendations; Guidelines, Guides (Navguide, VTS Guide), website (iala-aism.org & e-navigation.net) conferences and workshops. Note that IALA presently post eNavigation FAQs on their website.

**3.4 Roadmap of actions and timeline for implementation**

Note: Roadmap of actions to clarify common understanding necessary for the implementation of all RCOs, including responsible organizations/parties, priorities for deliverables and relevant key enablers.

IALA have produced a preliminary roadmap of key dates and activities for eNavigation through the year 2020. This document (Refxxxx) might be considered when developing a roadmap for the SIP.

**4 The future development of e-navigation**

**4.1 The continual assessment of user needs**

IALA will continue to work with its members to assess any new or evolving user needs within the scope of eNavigation and will aim to address these in cooperation with the IMO and other appropriate stakeholders.

**4.2 Proposals for a systematic assessment of how new technology can best meet defined and evolving user needs**

IALA will continue to work with its members to assess how new technology can best meet defined and evolving user needs within the scope of eNavigation and will aim to address these in cooperation with the IMO and other appropriate stakeholders.

**4.3 Possible use of additional and/or alternative analysis FSA.**

IALA has identified risk analysis models (IWRAP & PAWSA) that could be considered.

**4.4 Plan for the development of any technology and institutional arrangements necessary to fulfil the requirements of e-navigation in the longer term**

IALA is adopting a system of long term strategy planning and will consider issues of eNavigation within that.

The web portal e-navigation.net has been developed to be a hub of eNavigation information and feedback and may be a useful tool for the early identification of new user needs, technologies or services.