Proposed new work items for IALA Work Term 2023-2027

# Summary

Over the last few sessions of the IALA ENAV Committee, WG2 have developed a number of proposed tasks for the 2023-2027 work term. These have been collated in this input document for consideration, as appropriate, in the next work programme. This was provided as input to IALA ENAV30 as ENAV30-5.1.2.6.

## Purpose of the document

To provide input towards the IALA 2023-2027 work programme.

# Background and discussion

Using a standard template for work programme items, the attached are provided for consideration:

* Develop guidance for IALA members on the developments and implementation of the digital fairway
* Develop a Guideline for migrating current analogue VHF voice communications to digital VHF voice communications
* Develop guidance for IALA members on skills sets related to the digital environment (data analytics, maritime informatics) / Work with IALA WWA on possible model course / integration of digital intelligence into existing IALA model courses
* Develop guidance for IALA members and certification/standardisation bodies (e.g. IEC) on certification of technical MASS equipment, information systems and technical infrastructure in the domain of IALA.
* Develop guidance for IALA members on going from development test bed/ trial reporting to implementation.

It is also proposed that there be an ongoing activity to review and update documents as required.

| **ENAV Committee Work Programme 2022-2026** | | | |
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| **Standard** | S1060 – Digital Communication Technologies  S1070 – Information Services | | |
| **Topic Area** | Digital Fairway | | |
| **Task** | Develop guidance for IALA members on the developments and implementation of the digital fairway. | | |
| **Objectives of the task** | * Review guidance on the use of simulation in fairway / AtoN (IALA G1058 and G1097); * Identify best practice in development and use of digital twins; * Provide guidance on the use of digital twins for fairways / aids to navigation provision; * Identify uses of digital fairway for planning, monitoring and maintenance * Identify options to share information on the fairway infrastructure and services in a digital format with users * Link with, for example, IMT-2020 (5G) and beyond for data exchange, AI/ML, S100, * Identify opportunities to enhance sustainability through the use of technology / digital twins for fairways and AtoNs. | | |
| **Expected outcome** | New IALA guideline on implementing the development and implementation of digital fairways. | | |
| **Compelling need** | Existing IALA guidance on the use of simulation as a tool for waterway design and aids to navigation planning was last revised in 2011, with technical features and technology relevant for simulation of AtoN in 2013.  Through the past years IALA has been reviewing existing and emerging technologies of relevance to the work of the IALA membership. The results of those reviews have highlighted a number of opportunities for making best use of these technologies.  Developments in MASS includes changing requirements for the provision of AtoN, including data exchange and display.  The developments in Artificial Intelligence and Machine Learning, along with digitalisation in the maritime environment, provide unique opportunities to support sustainable design, implementation and monitoring of AtoN to support changing requirements. | | |
| **Strategic Alignment** | Goal 1:  G1 S2 Improve and harmonise the delivery of VTS globally and in a manner consistent with international conventions, legislative frameworks and public expectations.  G1‐S3 Harmonise the information structure, Maritime Service Portfolios, and communications for e‐Navigation by creating standards, and by cooperation with other IGOs, to achieve worldwide interoperability of shore and ship systems, including IMO sustainability goals for a maritime transport system.  Goal 2:  G2 S1 Position IALA as the source of standards, knowledge, and expertise that will enable States to undertake and share the technical development of aids to navigation, in accordance with UNCLOS, SOLAS, and other obligations.  G2 S3 Coordinate the further development of VTS, e‐Navigation, and short range aids to navigation, taking into account new technologies and sustainability. | | |
| **Scope** | **In Scope:**   * Identifying international best practice for implementing digital fairways * Reviewing existing IALA documents and determining suitable approach to update / consolidate or provide input into revisions (Specifically G1058 and G1097, G1113, G1114) * Liaise with ARM Committee for operational input * Develop a Guideline on the implementation of digital fairways | | |
| **Brief and concise description of the work to be undertaken and programme mile­stones** | Preparation of a new IALA Guidelines.  Key milestones include:   * October 2023 (ENAV31) – Scope Task and prepare skeleton. * March 2024 (ENAV32) – Sharing of best practices in digital twins (presentations / demonstrations); initial review of existing IALA documentation that may be relevant to the task * October 2024 (ENAV33) – Review / Revise scope based on presentations. Follow up on the review of existing IALA documentation. * March 2025 (ENAV34) – Draft guidelines * October 2025 (ENAV 35) – Draft guidelines * March 2026 (ENAV 36) – Finalise draft guideline, send for final review * October 2026 (ENAV37) – Finalise guidelines / send to IALA Council for approval | | |
| **Expected numbers of sessions for completion** | Session number:  31 32 33 34 35 36 37 38  x  X  X  X  X  X  X | | |
|  | **Origins** | Requested by ENAV Committee at [ENAV29] | |
|  | **Agreed by session** | **TD#** | **Comments** |
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|  | **Approved by Council** | *(Council Session)* | *(Date)* |
|  | **Revision Notes:** |  | |

| **ENAV Committee Work Programme 2023-2027** | | | |
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| **Standard** | S1060 – Digital Communication technologies | | |
| **Topic Area** | Digital communication （WG2/WG3） | | |
| **Task** | Develop a Guideline for migrating current analogue VHF voice communications to digital VHF voice communications | | |
| **Objectives of the task** | * Define the elements within current analogue VHF voice communications; * Define the new possibilities with digital VHF voice communication systems; * Develop guidance to assist Contracting States and Competent authorities to migrate their current analogue VHF voice system to a mixture of analogue VHF communications and digital voice VHF communications; * Establish links to existing IALA documentation; * Liaise with other bodies such as IMO, ITU, IHMA, IMPA, CIRM, ETSI, RTCM, CEPT on this matter. * Liaise with IALA VTS Committees as appropriate * Take into consideration outputs from related IALA workshops and seminars * Consider the impact and implications of MASS with regards to communications and data exchange within the AtoN environment. * Develop a working document towards a preliminary draft new ITU-R Recommendation for digital VHF marine radio to be submitted to ITU-R WP5B as a proposal. | | |
| **Expected outcome** | New and/or amended IALA guidelines providing guidance to Contracting States and Competent Authorities in regard to migrate to digital VHF voice communications. The guidelines to include infrastructure requirements, integration of future voice networks with other digital networks, and related requirements as may be identified during the work.  ITU will accept the proposal on preliminary draft new ITU-R Recommendation for digital VHF marine radio and start the work.  Agenda item on digital VHF marine radio communications for WRC-27.  Radio Regulations revised to accommodate digital VHF marine radio communication. | | |
| **Compelling need** | The voice radio telephony in the VHF maritime mobile band is important for communications in shipping. The current congestion in the VHF maritime mobile band has become a serious problem not only in CEPT countries and is continuing to grow. The move to implement digital VHF capabilities for DSC, AIS and VDES means the number of voice channels in the VHF maritime mobile band has been reduced.  Expand the capacity for marine VHF voice communications.  This will be discussed further at the ITU World Radio Conference 2023 (WRC-23). Input will be required at WRC-23 to support this item on the agenda for WRC-27. There is a requirement for focus work in advance of WRC-23 on the digitalisation of the maritime mobile band to highlight the importance of for future radiocommunications to support IALA membership.  The initial intent was to reduce the 12.5 kHz/6.25 kHz bandwidths as indicated in Recommendation ITU-R M.1084-5, but this has never been implemented. Also splitting duplex channels into simplex does not lead to the doubling of available voice channels due to the fact that AIS receiver sensitivity will be degraded in the “upper legs” unless the antennas are separated significantly. This is not always possible on ships.  The Recommendation ITU-R M.1084-5 provides ways to improve efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service; specifically describes technical characteristics when using channels spaced by 12.5 kHz and 6.25 kHz, migration to narrow-band channels, an example method for implementing interleaved narrowband channels at 12.5 kHz or 6.25 kHz offset spacing and assignment of channels numbers to interleaved channels and simplex operation of duplex channels.  The introduction of new techniques will provide higher quality and more channels for VHF voice radio communications. There are additional benefits such as better support for safety and security measurements and improved situational awareness for mariners, Contracting States and/or Competent authorities.  This has implications for ship and shore side, including opportunities to rationalize infrastructure requirements to support digital data exchange.  This activity relates to [proposed work item on migration plan] noting the requirement to liaise with other organisations including ITU and IMO. | | |
| **Strategic Alignment** | Goal 1:  G1 S1 Develop standards suitable for direct citation by States in areas deemed important by the General Assembly, and continue to improve strong governance, including document policy and procedure for standards.  G1 S2 Improve and harmonise the delivery of VTS globally and in a manner consistent with international conventions, legislative frameworks and public expectations.  G1‐S3 Harmonise the information structure, Maritime Service Portfolios, and communications for e‐Navigation by creating standards, and by cooperation with other IGOs, to achieve worldwide interoperability of shore and ship systems, including IMO sustainability goals for a maritime transport system.  Goal 2:  G2 S1 Position IALA as the source of standards, knowledge, and expertise that will enable States to undertake and share the technical development of aids to navigation, in accordance with UNCLOS, SOLAS, and other obligations.  G2 S3 Coordinate the further development of VTS, e‐Navigation, and short range aids to navigation, taking into account new technologies and sustainability.  G2 S4 Create standards for the design and analysis of aids to navigation systems in areas where increasing environmental and economic developments are affecting navigable waters | | |
| **Scope** | **In Scope:**  Creating guidelines for:   * Define key elements for voice communication and voice communication networks * Migrating from current analogue VHF voice systems to digital VHF voice systems; * Liaise with VTS Committee * Consider developments at ITU, noting the outcomes of WRC-19, preparation for WRC-23 and the decision to consider digital VHF Voice at WRC-2027. * Liaise with IMO on developments, noting implications for ship side infrastructure and developments MASS. | | |
| **Brief and concise description of the work to be undertaken and programme mile­stones** | Preparation of a new IALA Guidelines.  Key milestones include:   * October 2023 (ENAV31) – Scope Task and prepare skeleton * March 2024 (ENAV32) – Monitor developments * October 2024 (ENAV33) – Monitor developments * March 2025 (ENAV34) – Improve Draft guidelines – seek input from other IALA Committees / note developments at ITU * October 2025 (ENAV35) – Improve Draft guidelines, taking into account input from other IALA Committees * March 2026 (ENAV36) - Continue development of draft guidelines * October 2026 (ENAV37) - Complete Draft guidelines, submit to Council for approval. * March 2027 (ENAV38) – additional session if required | | |
| **Expected numbers of sessions for completion** | Session number:  31 32 33 34 35 36 37 38  x  X  X  X  X  X  X  X | | |
| **Committee notes** | **Origins** | Requested by ENAV Committee at [ENAV29] | |
|  | **Agreed by session** | **TD#** | **Comments** |
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|  | **Approved by Council** | *(Council Session)* | *(Date)* |
|  | **Revision Notes:** |  | |

| **ENAV Committee Work Programme 2023-2027** | | | |
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| **Standard** | S1050 – Training and Certification  S1060 – Digital Communication Technologies  S1070 – Information Services | | |
| **Topic Area** | Training in implementation of digital solutions (data analytics & maritime informatics) | | |
| **Task** | Develop guidance for IALA members on skills sets related to the digital environment (data analytics, maritime informatics)  Work with IALA WWA on possible model course / integration of digital intelligence into existing IALA model courses | | |
| **Objectives of the task** | * Scan industry / related industries and identify skill sets required in an increasingly digital environment * Identify existing training on digital intelligence, data analytics, maritime informatics * Working with IALA WWA identify requirements of IALA members regarding training to address digital developments * Based on analysis / gap analysis develop a guideline on training to support the implementation of digital technologies in the AtoN / Port environment * If determined appropriate, work with IALA WWA to develop a model course / content for existing model courses related to digital intelligence. | | |
| **Expected outcome** | New IALA guideline on digital intelligence in the port and AtoN environment.  Development of content for possible training programs related to digital intelligence (with IALA WWA) | | |
| **Compelling need** | The digital transformation of the maritime environment continues to bring about significant change in operations and competence requirements for personnel.  While there are many developments, these require a structured approach to provide education and training for existing personnel and for new personnel. There are examples of international best practice that can be drawn upon support this work, including the work of the IALA WWA. | | |
| **Strategic Alignment** | Goal 1:  G1 S2 Improve and harmonise the delivery of VTS globally and in a manner consistent with international conventions, legislative frameworks and public expectations.  Goal 2:  G2 S1 Position IALA as the source of standards, knowledge, and expertise that will enable States to undertake and share the technical development of aids to navigation, in accordance with UNCLOS, SOLAS, and other obligations.  G2 S3 Coordinate the further development of VTS, e‐Navigation, and short range aids to navigation, taking into account new technologies and sustainability. | | |
| **Scope** | **In Scope:**   * Identifying international best practice * Working with other IALA Committees and IALA WWA to verify requirements / gap analysis * Reviewing existing IALA documents to determine where digital intelligence may sit * Develop (with IALA WWA) model courses or content for existing model courses on digital intelligence within the port / AtoN environment | | |
| **Brief and concise description of the work to be undertaken and programme mile­stones** | Preparation of a new IALA Guidelines.  Key milestones include:   * October 2023 (ENAV31) – Scope Task and prepare task work plan. * March 2024 (ENAV32) – Research and share best practice * October 2024 (ENAV33) – Review research * March 2025 (ENAV34) – Verify expectations (guideline / model course); draft content * October 2025 (ENAV35) – Improve Draft content – forward to other IALA Committees for review * March 2026 (ENAV 36) – Review draft content (based on input from other IALA Committees) * October 2026 (ENAV37) - Finalise draft content / forward as appropriate for council approval | | |
| **Expected numbers of sessions for completion** | Session number:  31 32 33 34 35 36 37 38  x  X  X  X  X  X  X | | |
| **Committee notes** | **Origins** | Requested by ENAV Committee at [ENAV29] | |
|  | **Agreed by session** | **TD#** | **Comments** |
|  |  |  |
|  | **Approved by Council** | *(Council Session)* | *(Date)* |
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| **ENAV Committee Work Programme 2023-2027** | | | |
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| **Standard** | S1060 – Digital Communication Technologies  S1070 – Information Services | | |
| **Topic Area** | Providing guidance on the certification of technical equipment, information systems and technical infrastructure related to MASS in the domain of IALA. | | |
| **Task** | Develop guidance for IALA members and certification/standardisation bodies (e.g. IEC) on certification of technical MASS equipment, information systems and technical infrastructure in the domain of IALA. | | |
| **Objectives of the task** | * Identify existing certification procedures and performance test specifications for technical MASS equipment and infrastructure; * Identify (shoreside) infrastructure and counterparts on the shipside within the remit of IALA that are envisioned for being utilized by MASS applications, focusing on AtoNs including VTS and Maritime Services; * Seek input from IALA members on their experiences and processes for certification of maritime equipment and infrastructure; * Seek input from experts in IEC/ISO on the procedures and performance test specifications for MASS equipment and infrastructure; * Develop guidance for the certification of such technical systems and infrastructure to support certification/standardisation bodies; * Develop guidance for IALA members on how such technical systems must be certified; * Link with Innovation Hub * Refer to existing IALA documents (i.e. G1107) * Review existing documentation (i.e., IMO documents, IEC/ISO standards, existing procedures from certification/standardisation bodies, such as DNV, Bureau Veritas or Lloyds Register, procedures identified in 3GPP (device specific)) * Identify when liaison with other competent authorities and / or organisations may be required, especially with IMO and/or IEC; | | |
| **Expected outcome** | New IALA guidance document(s) on the certification of technical equipment, information systems and technical infrastructure related to MASS in the domain of IALA  Input to IMO or certification/standardisation bodies to assist in the definition of certification procedures for technical equipment, information systems and technical infrastructure in the domain of IALA. | | |
| **Compelling need** | Certification is an important step in the development and deployment of MASS applications. There is a compelling need to address this topic within the domain of IALA. Having procedures in place for performance testing and certification of MASS technical equipment and shoreside infrastructure is an important step for the safety and technical harmonization of MASS products and (MASS compatible) Aids to Navigation. IALA should consider providing guidance for standardization and certification bodies how existing procedures and performance tests can be adapted. Also, the impact of these procedures for IALA members should be evaluated.  This activity especially focusses on technology and information systems in the domain of IALA and its counterparts on the shipside. It is not intended to introduce new certification processes with IALA as a certification body, but to provide additional information to enhance existing processes with the expertise from IALA in the areas of AtoNs including VTS and Maritime Services in the context of e-Navigation. | | |
| **Strategic Alignment** | Goal 1:  G1 S3 Harmonise the information structure, Maritime Service Portfolios, and communications for e‐Navigation by creating standards, and by cooperation with other IGOs, to achieve worldwide interoperability of shore and ship systems, including IMO sustainability goals for a maritime transport system.  Goal 2:  G2 S1 Position IALA as the source of standards, knowledge, and expertise that will enable States to undertake and share the technical development of aids to navigation, in accordance with UNCLOS, SOLAS, and other obligations.  G2 S3 Coordinate the further development of VTS, e‐Navigation, and short range aids to navigation, taking into account new technologies and sustainability. | | |
| **Scope** | **In Scope:**  Creating guidelines for:   * Identifying international best practice * Developing a template process/roadmap * Reviewing existing IALA documents to determine if updates are required | | |
| **Brief and concise description of the work to be undertaken and programme mile­stones** | Preparation of a new IALA Guidelines.  Key milestones include:   * October 2023 (ENAV31) – Scope Task and prepare skeleton. * March 2024 (ENAV32) – Research and share existing documentation and procedures. * October 2024 (ENAV33) – Draft guideline, liaise with other organizations (if required). * March 2025 (ENAV34) – Improve Draft guidelines – forward to other IALA Committees for review, liaise with other organizations (if required) * October 2025 (ENAV35) - Complete Draft guidelines forwarding to Council for approval. * March 2026 (ENAV36) – Additional session, if required. | | |
| **Expected numbers of sessions for completion** | Session number:  31 32 33 34 35 36 37  X  X  X  X  X  -  X | | |
| **Committee notes** | **Origins** | Requested by ENAV Committee at [ENAV29] | |
|  | **Agreed by session** | **TD#** | **Comments** |
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|  | **Approved by Council** | *(Council Session)* | *(Date)* |
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| **ENAV Committee Work Programme 2023-2027** | | | |
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| **Standard** | S1060 – Digital Communication Technologies  S1070 – Information Services | | |
| **Topic Area** | Providing guidance on the process to implement developments of innovation. | | |
| **Task** | Develop guidance for IALA members on going from development test bed/ trial reporting to implementation. | | |
| **Objectives of the task** | * Identify best practice in the implementation of innovative solutions; * Define the process to move from ‘development’ to ‘implementation’; * Develop guidance to assist IALA members in the implementation of solutions developed through test beds noting technology readiness levels; * Establish links to existing IALA documentation; * Review existing documentation (i.e. ACCSEAS work) * Identify a way to share lessons learned in implementing innovative solutions (IALA ‘body of knowledge’ or similar); * Identify when liaison with other competent authorities and / or organisations may be required; * Assist IALA and IALA members when technology is mature enough to recommend implementation. | | |
| **Expected outcome** | New IALA guideline on implementing the results of test beds, with a sample ‘template’ roadmap – implementing existing technologies / new technologies to meet a need.  Identification of a body of knowledge / sharing of best practices within the IALA membership. | | |
| **Compelling need** | Through the past years IALA has implemented a way to share activity surrounding e-navigation test beds. There is now a review of G1107 underway to broaden the scope and encompass the many developments surrounding digital data exchange, technology to support MASS, and more.  While there are many developments, these require a structured approach to move from innovation to implementation. There are examples of international best practice that can be drawn upon (ACCSEAS) to identify a template that could be adapted by IALA members for use as the digitalization of the maritime industry continues. | | |
| **Strategic Alignment** | Goal 1:  G1 S2 Improve and harmonise the delivery of VTS globally and in a manner consistent with international conventions, legislative frameworks and public expectations.  G1‐S3 Harmonise the information structure, Maritime Service Portfolios, and communications for e‐Navigation by creating standards, and by cooperation with other IGOs, to achieve worldwide interoperability of shore and ship systems, including IMO sustainability goals for a maritime transport system.  Goal 2:  G2 S1 Position IALA as the source of standards, knowledge, and expertise that will enable States to undertake and share the technical development of aids to navigation, in accordance with UNCLOS, SOLAS, and other obligations.  G2 S3 Coordinate the further development of VTS, e‐Navigation, and short range aids to navigation, taking into account new technologies and sustainability. | | |
| **Scope** | **In Scope:**  Creating guidelines for:   * Identifying international best practice * Developing a template process/roadmap * Reviewing existing IALA documents to determine if updates are required | | |
| **Brief and concise description of the work to be undertaken and programme mile­stones** | Preparation of a new IALA Guidelines.  Key milestones include:   * October 2023 (ENAV31) – Scope Task and prepare skeleton. * March 2024 (ENAV32) – Research and share best practice / roadmaps * October 2024 (ENAV33) – Draft guideline * March 2025 (ENAV34) – Improve Draft guidelines – forward to other IALA Committees for review * October 2025 (ENAV35) - Complete Draft guidelines forwarding to Council for approval. * March 2026 (ENAV36) – Additional session if required | | |
| **Expected numbers of sessions for completion** | Session number:  31 32 33 34 35 36 37  X  X  X  x  X  -  X | | |
| **Committee notes** | **Origins** | Requested by ENAV Committee at [ENAV28] | |
|  | **Agreed by session** | **TD#** | **Comments** |
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