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| From: WG1, Sub Group on VTS Strategy | VTS37-14.2.1.2 Task21\_WP1\_v4 |
| To: VTS Committee |  |

IALA VTS Strategy Paper addressing the delivery of VTS in a rapidly changing world

# Introduction

The IALA Council at its 53rd session approved the proposed task (*VTS34/output/8*) to develop a strategy paper addressing the delivery of VTS in a rapidly changing world.

This Task includes the following actions:

1. Develop an IALA VTS Strategy with regards to the delivery of VTS in a rapidly changing world;
2. Identification of possible implications for IMO Resolution A.857(20) Guidelines for Vessel Traffic Services.
   1. Identify and document:
      1. the strengths and weaknesses of IMO Resolution A.857(20) in setting the framework for the delivery of VTS;
      2. developments in VTS since the existing Resolution was agreed and emerging trends that may be anticipated over the next 10-20 years;
      3. possible limitations to addressing the emerging needs and developments for VTS within the existing provisions of IMO Resolution A.857(20).
3. Provide a draft IALA VTS Strategy Paper outline and requisite Policy Objectives for the development of VTS to meet the emerging needs and developments over the next 10-20 years. Key milestones for completing the task include:

* VTS Committee prepare a draft outline of the ‘IALA Strategy on VTS’ paper’ (Sep 2012);
* IALA Council endorse the draft outline of the ‘IALA Strategy on VTS’ paper’ (Dec 2012);
* VTS Committee prepare a draft ‘IALA Strategy on VTS’ paper (Mar 2013);
* VTS Committee discusses the draft IALA Strategy on VTS paper with the aim for approval (October 2014);
* VTS Committee finalises the draft ‘IALA Strategy on VTS’ paper (April 2015), taking eventual comments by the Committee and submits to Council for approval;
* Approval by the Council of the draft ‘IALA Strategy on VTS’ paper’ (September 2015);

# Background

IALA, through the VTS Committee, deals with all aspects of VTS, including the expanding role of vessel monitoring for maritime safety, environmental protection and security. The Committee aims to develop and review VTS related IALA documentation on issues such as the training of VTS personnel, operational procedures, equipment requirements, the impact on the provision of services, responsibilities, the impact of new technologies and the role of VTS in security and global traffic monitoring systems.

The IALA VTS Manual 2012 (Section 0312) states:

*‘IALA recognises that the trends in maritime operations towards enhanced safety, security, efficiency, accountability and environmental responsibility, together with anticipated technical advances, will result in significant future change. As a consequence and where appropriate, IALA will initiate and lead developments, influence debate, and produce relevant recommendations and guidelines that may impact on the use or management of aids to navigation, including VTS.’*

In progressing Task 10 (Produce Guidelines on the provision of VTS Types of Service) and Task 3 (Review/update/provide input to IMO on Resolution A.857(20) - Guidelines for Vessel Traffic Services) during VTS34 possible shortcomings and differing interpretations in the delivery of VTS in a rapidly changing world were highlighted.

In considering these short comings and differing interpretations the Committee identified the compelling need for a high-level policy document describing the objectives for VTS to meet the emerging needs and developments and the adequacy of the existing international framework for VTS.

# General Principles

To develop the vision for the future delivery of VTS in the next 10 – 20 years, a number of steps have been identified and could provide the outline for the VTS Strategy paper (Annex B).

It is proposed that in developing the IALA Strategy on VTS the following principles should be applied in drafting a VTS Strategy paper:

* the development of the Strategy on VTS should fit under the umbrella of the overall IALA Strategy 2014-2026 (approved by Council, December 2013);
* establish a mission statement for VTS based on IALA’s mission statement;
* establish a vision on the future delivery of VTS consistent with IALA’s VTS/overall mission statement;
* establish and define the goals to achieve the vision;
* as the Strategy on VTS follows the vision identify the tasks to achieve the goals;
* the Strategy will focus on “what does the maritime domain expects VTS to deliver and what does VTS deliver now”;
* a strategic approach will be developed for understanding, acceptance and support of IALA’s Strategy for the future delivery of VTS

**4 IALA Strategic Vision 2014-2026**

The IALA Council, at its 56th Session in December 2013, approved the overall IALA Strategic Vision for the period 2014-2026, which shows two goals to be achieved in this period and a number of VTS related strategies:

* G1 Ensure that aids to navigation systems and related services, including   
   e-Navigation, Vessel Traffic Services, and emerging technologies, through  
   international cooperation and the provision of standards are harmonised;
* 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;*
* *S2 - Improve and harmonise the delivery of VTS globally and in a manner  
   consistent with international conventions, legislative frameworks and  
   public expectations;*
* *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;*
* G2 All coastal states have contributed to an efficient global network of aids to  
   navigation and services for the safety of navigation, through capacity  
   building and the sharing of expertise;
* *S2 - Continue to develop capacity building activities to improve the global  
   operations and management of aids to navigation systems and  
   related services including VTS;*
* *S3 - Coordinate the further development of VTS, e-Navigation, and short  
   range aids to navigation, taking into account new technologies and  
   sustainability.*

# 5 Proposed Mission statement and policy objectives for VTS

IALA’s Constitution (Article 2) states:

*The aim of IALA is to foster the safe, economic and efficient movement of vessels, through improvement and harmonisation of aids to navigation worldwide and other appropriate means, for the benefit of the maritime community and the protection of the environment*.

Based on this statement the following VTS Mission Statement is proposed:

*“IALA’s mission for VTS is to foster the safe, economic and efficient movement of vessels and the protection of the marine environment, through improvement and harmonization of the delivery of VTS worldwide in a rapidly changing maritime environment, for the benefit of the maritime community and in support of other services*.”

# 6 Vision

Substantial recent and future changes in the global shipping environment have been identified, such as:

* an increase in the volume of vessel traffic;
* increasing pressure on navigable waters - especially in coastal waters, dense traffic areas and confined waters;
* increasing dependency on interconnected global supply chains - dependencies that may easily be complicated by conflicts of interest or insufficient interoperability between the many stakeholders involved - and
* the rapid development and availability of modern and more efficient technologies;

Trends, such as globalization and the extensive use of new information and communication technologies have already provided opportunities for enhanced interaction and information sharing, not only between ships and shore-based authorities, but also with and between many other stakeholders in the maritime domain. IALA’s VTS Committee has recognized this and finalized a new Guideline no. 1102 on *VTS Interaction with Allied and Other Services* (approved by Council, December 2013).

Due to the increasing role of VTS and its capabilities for information management, given the international nature of maritime transport (*boundaries do not exist anymore*), it is foreseen that:

**“Future VTS services will be adopted from berth to berth to facilitate safe, efficient and economic movement of vessels and protection of the marine environment in a changing maritime domain”**

The complexity of utilization of the manoeuvrable space for shipping is growing, threatening the “maritime commons”. As a result, safe navigation and accessibility in many sea, coastal and port approaching areas worldwide are increasingly under pressure. This also threatens the protection of the marine environment. The need for proactive management of vessel traffic in these areas is rapidly growing, as well as the need for enhancement of the interaction between ships and relevant shore based authorities.

Managing of operational space from a shipping perspective by evolving Vessel Traffic Services, supported by the capabilities of e-Navigation and its Maritime Service Portfolio developments, and in conjunction with the development of guidelines for Marine Spatial Planning (planned task for the IALA ARM Committee) are seen as a combination how to deal with the challenges ahead in order to secure future safe and efficient navigation.

Based on the above it is expected that the current tasks and traffic management functionalities of VTS, as reflected in IMO Resolution A.857(20) and in various IALA Guidelines and Recommendations, will extend and be executed in an increasing innovative manner responding to changing user needs and public expectations.

The worldwide harmonized provision of present and future Vessel Traffic Services, their procedures and usage of technologies shall be the ultimate aim, but focus should be kept on two **basic principles**:

* the recognition that worldwide on regional, national or local level circumstances may differ due to for instance geographical circumstances, traffic density and diversity, accessibility, environmental conditions and the position and role of VTS in the maritime domain in a certain area;
* and therefore the determination and decision of which services and on what level they shall be provided to shipping and other stakeholders in their areas of responsibility will remain assigned to the relevant regional, national or local authorities.

IALA is recognized as the most important international organisation providing guidance on how to organize maritime traffic. VTS is recognized as one of the most important instruments for organizing and monitoring marine traffic in all types of areas. Therefore it is IALA’s role to:

* continue the development of all relevant aspects of future VTS, such as organizational, administrative, operational, personnel, training and technical issues;
* subsequently to develop standards on these issues and to prepare proposals for alterations in relevant legislation and rules in support of the appropriate international bodies [e.g. IMO, ITU].

# 7 IALA Goals for future VTS

# In accordance with the IALA Strategy and its goals, the VTS related strategies, as reflected in Chapter 4, can now be more refined.

1. To promote the worldwide use of the fullpotential of VTS to meet the new challenges and developments in the maritime domain, e.g. the concept of a Sustainable Maritime Transportation System.[[1]](#footnote-1)
2. Harmonized and coordinated delivery of VTS from berth to berth:
   1. To foster extension of VTS beyond its current limits, noting increasing interaction between shore/ship and co-operation between competent authorities
   2. To establish inter-VTS data and information exchange
   3. To support multiple allied and other services
   4. To establish stand-alone communication procedures for VTS to facilitate clear and unambiguous transfer of information

## To implement mandatory training and certification for VTS operators in order to ensure a consistent and harmonized delivery of VTS worldwide.

1. Worldwide management of vessel traffic in a harmonized, transparent and uniform manner by promoting:
   1. co-operative decision-making in matters concerning maritime safety and traffic management processes;
   2. the use of harmonized planning and risk assessment instruments by VTS worldwide in support of TOS;
   3. the use of harmonized validation and certification instruments for VTS worldwide;
   4. the use of VTS systems, equipment and applications complying with the harmonized functional and technical provisions of the Maritime Services Portfolios as developed within the e-Navigation concept;
   5. the provision of services by VTS delivered in a strategic, tactical and operational level.
2. All the legal provisions regarding to data and information management for VTS in relationship to other stakeholders should be in place.
3. All the responsibilities for VTS authorities and VTSO which may be affected by the new challenges and future developments in the maritime domain should be defined and regulated in a transparent manner.
4. Increased awareness among mariners concerning the delivery of services by VTS,
5. Regulatory provisions should be timely in place for the extension and/or modification of present services, and new services under development, where appropriate.

# 8 Revision of IMO Resolution A.857

# Developments and Emerging Trends

Since the existing IMO Resolution A.857(20) came into force new developments in VTS and emerging trends that may be anticipated over the next 10-20 years have been considered and examples are at **Error! Reference source not found.**(1)

# Implications for IMO Resolution A.857(20)

The strengths and weaknesses of IMO Resolution A.857 (20) to meet current trends and future developments of VTS have been identified and are at **Error! Reference source not found.**(2).

# Limitations identified within the existing IMO Resolution A.857(20)

Examples of limitations to addressing the emerging needs and developments for VTS within the existing provisions of IMO Resolution A.857(20) are shown at ANNEX A(3).

* **Limitations on other relevant legislation** [*further to be developed*]

Examples of limitations on other relevant legislation are shown at ANNEX A(4)

# 9 Detailed identification of IALA tasks and deliverables

The development of an IALA Strategy and Vision on the future delivery of VTS covers a large variety of subjects. Although an integral approach is essential it will be necessary to program the work to be done in detail, one by one, finalized with a clear deliverable.

The identification of tasks and deliverables, under de umbrella of G1 – S2 and G2 – S3, incorporated in a time schedule (2014-2018 and 2018-2022) will be necessary to manage the process. The proposal for this overview will be contained in Annex C.

# 10 A strategic approach for acceptance and support of IALA’s Strategy for the future delivery of VTS

# In line with Article 4 of IALA’s Constitution the organisation will maintain liaison and cooperate with relevant intergovernmental, international and other organisations, offering specialised advice where appropriate.

It is envisaged that a strategy and vision on the future delivery of VTS will have an impact on current legislation, responsibilities of organizations, service provision, coverage, procedures, training and technical infrastructure and equipment.

It is also envisaged that this will affect IMO Resolution A.857(20), which probably will have to be rewritten. In time even a modification of SOLAS V, Resolutions 10, 11 and 12 may be necessary.

Taking into account the (rather conservative) positions in the maritime community, as well as the current workload in the IMO and its relevant Sub-Committees, a top-down process – SOLAS > Resolution A.857(20) > IALA Guidelines and Recommendations – is unlikely and unrealistic and will restrict VTS developments in IALA.

IALA’s role is to continue the development of all relevant aspects of future VTS, in this respect being the “preparatory policy making organization for IMO”. A role which is envisaged by the SG IMO in presenting the concept for a Sustainable Maritime Transportation System.

Therefore a strategic approach has been explored and developed for understanding, acceptance and support of IALA’s Strategy for the future delivery of VTS. This so-called “*gradual* *bottom-up*” approach, reflected in Annex B, may also be used as the main skeleton for a Communication Plan to be developed.

ANNEX A

1. Developments and emerging trends WHICH IMPACT ON IMO RESOLUTION A.857(20)

|  |  |
| --- | --- |
| Developments in VTS since the existing IMO Resolution A.857(20) was approved | **Technology** –  AIS, CCTV, LRIT, Satellite based AIS, Computer Technology, New Radar Technology, new symbology, Electronic Nautical Charts |
| **Communications** –  AIS, Network technologies, VOIP, implementation of GMDSS,  VHF Channelling, introduction of electronic notifications,  implementation of high speed digital communications |
| **Guidance –**  Primary tasks of VTS evolved since the first development of the Resolution. New and reviewed IALA Recommendations and Guidelines have not been incorporated since 1997 |
| **VTS in maritime domain -**  Increasing interaction outside traditional VTS - due to globalization of shipping and the increasing information position of VTS and its increasing communications capabilities |
| **Legislation/regulations -** Implementation of   * ISPS Code (Security) * International Aeronautical and Maritime Manual on Search and Rescue (IAMSAR) * Monitoring Guidelines on Dangerous Goods * MARPOL |
| Emerging trends that may be anticipated within the next 10-20 years | **In general:**   * Increasing public expectation for safety, security and environmental protection in the marine environment. * Adoption of e-Navigation * Need for operational delivery of primary tasks of VTS will due to increasing intensity and diversity of shipping * scale enlargement of ships * economies of scale in shipping * claims for alternative use of maritime manoeuvrable space (e.g. OREI - Offshore Renewable Energy Infrastructures-, fishfarms) * growing perception that the organization of maritime traffic (including most if not all types of shipping) should be further developed |
| **Operational:**   * A shift of focus towards Traffic Organisation Service * An increase of route and traffic planning * Increase of Routing advises (berth-to-berth) from shore * Worldwide increase number of Traffic Separation Systems (TSSs) * Implementation of VTS beyond territorial waters * An increasing need for collaboration between neighbouring VTSs * A rapid automation of VTS related port processes * Increasing * need for linking to the logistic chain * use of VTS for navigational efficiency and planning in collaboration with other nautical services; * need from other parties for access to information available from VTS (due to its increasing information position) |
| **Communications -**   * Digitalisation of maritime VHF frequencies is foreseen and most probably autonomous and irreversible. * New technologies (under e-navigation) * Introduction Inter VTS Exchange Format (IVEF) * Implementation VHF Data Exchange System (VDES) * Implementation National Single Windows for data exchange * Modernization GMDSS |
| **Organization and responsibilities:**   * The introduction of new services (development Maritime Service Portfolio under e-navigation) may lead to   + new responsibilities and liabilities of the VTS, VTSOs and the VTS Authority   + changes in the traditional operational structure of the organizations   + new or extra competences for VTSO on various levels   + the need to respond to (evolving) Quality Management Systems |
| **Legislation -**  • Due to the increasing complexity of international maritime shipping an increase of legislation , regulations and Guidelines for operating VTS are to be expected.  • Certification of the performance of VTS is expected, the need for certification of the VTS organization may be studied  • The imbedding of changes in SOLAS V, Resolution 12 |
| **Training and Simulation**   * Due to all foreseen developments training Guidelines and Model Courses may have to be reviewed and adjusted to new operational and organizational needs; * The requirements for simulation training will have to be further developed and increased; * Need for an internationally recognized mandatory VTSO certification (in a system similar to STCW) |

1. Examples of the strengths and weaknesses of the current IMO Resolution A.857(20)

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| --- | --- |
| **Strengths** | **Weaknesses** |
| Vessel Traffic Services (VTS) are recognised under SOLAS, (Chapter V Regulation 12) as contributing to safety of life at sea, safety and efficiency of navigation and protection of the marine environment. | The Resolution is over 16 years old and was adopted:   * prior to the last SOLAS amendment relating to VTS (Regulation 12 -textual change in 1997 and adopted in 1999); * prior to modern technologies; * at a time when VTS was in its infancy. VTS is now a mature and established partner in the maritime domain with respect to its role, function and interaction with other services; * at a time when the globalisation of maritime shipping had just commenced and the impact on VTS (boundaries, responsibilities, etc.) was unclear. |
| Provides Internationally recognised guidelines for Contracting Governments / Competent authorities to authorise VTS Authorities to deliver VTS services worldwide | Although there is a mechanism to amend the Resolution it is recognized that the process often requires considerable inter-government coordination which may prevent changes in a timely manner to meet recent developments and maintain transparency and currency. |
| Provides guidance as to the responsibilities and liabilities of VTS authorities | The definitions in the Resolution are in need of review and amendment as identified by IALA recent guidance In addition new definitions are also required. It has been noted that commonly accepted and unambiguous definitions are in line with the IMO harmonization policy. |
| Provides Internationally recognised guidelines for planning and implementing a VTS | The level of the types of services needs to be defined as they currently are a source for continuous debate. |
| Provides internationally agreed guidelines on recruitment, qualification and training of VTS operators | The Resolution needs to provide specific guidance on   * mandatory training * the requirements for validity, renewal or compulsory expiry of certification. |
| The delivery of VTS services is transparent to mariners | Guidance is also needed for:   * the management of maritime data and information, * ensuring a legal basis for information sharing and re-use of data in accordance with national and international law * VTS - Pilotage interoperability |
| There are *VTS like services* provided by non-competent VTS authorities (e.g. commercial operators wind-or-fish farms and other offshore installations), which are not bound to the present Resolution. The services provided by these parties according to the current Resolution are no VTS service, however clarity is needed about their legal position and responsibilities. |
|  | According to A.857(20) Annex 1, point 3, by establishing a VTS, the guidelines for Criteria for Ship Reporting Systems (SRS) should be used in conjunction with A.857(20). Theses guideline for Criteria for SRS has not been reviewed since 1994. However, since then VTS as an instrument evolved and has, compared with the instrument SRS, different objectives. |

1. Possible limitations within the existing IMO Resolution A.857(20)

The present IMO Resolution A.857(20), adopted in 1997 with its original structure unchanged, is not flexible enough for and may obstruct the introduction of new items, such as the operation of Navigational Assistance Service (NAS), VTS supporting other services such as Security, VTS beyond Territorial Waters, berth-to-berth advices from shore etc.

The relationship with other (also evolving) services and its consequential responsibilities and liabilities may also be constrained by the existing Resolution.

Most textual changes to IMO Resolution A.857(20) will not promote the transparency and its unambiguity.

Consequential aspects in respect to SOLAS V (Regulations 10, 11, 12) for a future delivery of VTS in a rapidly changing maritime domain need further study as a consequence of the vision to be developed.

**4 LIMITATIONS ON OTHER RELEVANT LEGISLATION [*further to be developed]***

**ANNEX B**

**A strategic approach for acceptance and support of IALA’s Strategy   
for the future delivery of VTS**

As indicated in chapter 10 it is unlikely and unrealistic to expect that, given the circumstances, a top-down process in the IMO – proposed modification of SOLAS >> rewriting Resolution A.857(20) >> development or modification of IALA Guidelines and Recommendations –will lead to success in the years ahead. Such a slow process will restrict VTS developments in IALA.

For tactical reasons a strategic approach has been explored and developed for understanding, acceptance and support of IALA’s Strategy for the future delivery of VTS. This so-called **“*gradual bottom-up*”** approach is reflected in the high-level scheme below.

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|  |  | After approval in IMO/NCSR proposed modifications SOLAS V to MSC for final approval |  | 2020 | ***IALA Activities*** | |
|  |  | After Council approval document with proposals for modifications SOLAS V to be sent to IMO/NCSR (supported by member states) with the aim for approval | Mar 2019 |  | On-going process of development of new Guidelines and Recommendations or review of existing ones |
|  |
|  |  | After approval in IMO/NCSR “new” Resolution A.857(20) to MSC for final approval | Jun 2018 | Preparation of document with proposals for eventual modifications SOLAS V |
|  |  | Draft “new” Resolution A.857(20) after Council approval to be sent to IMO/NCSR with the aim for approval | Sep 2017 |  |
|  | Inform IMO/NCSR via INF-paper about   the progress and results | | 2017 | Modification or rewriting Resolution A.857(20) based on the developed vision and relevant new or modified IALA Guidelines and Recommendations |
|  |  | Inform IMO/NCSR through the approved INF-paper on the VTS activities and intentions of IALA | 2016 |  |
|  | . | VTS Strategy Paper finalized and approved by Council, also INF-paper to IMO/NCSR finalized and approved | Sep  2015   2014 | Identification of all relevant VTS issues, task overview finalized April 2015 (VTS39), start review process |
| **Start** |  | 2013 | | | VTS Committee started development VTS Strategy Paper |  |

Note: ref Timeschedule - slow decision process in IMO taken into account

**ANNEX C**

**Detailed identification of IALA tasks and deliverables**

= further to be developed =

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **IALA’s Strategy Goals 2014-2026** | **Relevant VTS Strategies** | **Tasks Work Programme VTS Committee 2014-2018** | **Strategic Goals resulting from IALA Strategy Future VTS** | **Deliverable(s)** | **Delivery** |
| G1 | S1 | T.. - | SG .. - | *Guideline* | *VTS-42* |
| SG .. - | *Recommendation* | *VTS48* |
| SG .. - | *Review Guideline* | *VTS43* |
| SG .. - |  |  |
| T.. - |  |  |  |
| T.. - |  |  |  |
| T.. - |  |  |  |
| S2 |  |  |  |  |
| S3 |  |  |  |  |
| G2 | S1 |  |  |  |  |
| S2 |  |  |  |  |
|  |  |  |  |  |  |
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Note: based on discussions in Sub-Working Group, using the developed matrix, the above shown new matrix could incorporate all necessary information.

Columns 1 and 2 don’t need further explanation as this is already worked out in chapter 4. In column 3 the agreed WP 2014-2018 for the Committee can be reflected. In column 5 the strategic actions as a result of the development of the IALA Strategy for future VTS can be inserted (e.g. a translation of the issues mentioned in Chapter 7 and others). Deliverables can be a new Guideline, Recommendation, Review of documents etc. The Column Delivery will indicate when the deliverable is expected to be finalized. = **the text in red in the last two columns are just examples** =

1. Paper on a Sustainable Maritime Transportation System, presented by SG IMO at World Maritime Day 2013

   [↑](#footnote-ref-1)