NEW INTERNATIONAL GUIDELINES FOR VESSEL TRAFFIC SERVICES. REVISION OF IMO RESOLUTION A.857(20).

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Abstract:

The recognition of the International Maritime Organization (IMO) in 1985 and the publication of the first guidelines was a definitive stage for the Vessel Traffic Services (VTS). However, the last revised version of the Guidelines for VTS was published in 1997, Resolution A.857(20)[1], and has remained in force since then. A hiatus of 22 years has more than justified its urgent review. The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) has been working on the current revision of this Resolution through several sessions of the VTS Committee. After the main author's participation in its last Seminar, this paper analyses changes to be introduced and how VTS Centres will be affected. This paper will examine some of the initial key changes to the system, including new definitions, such as "the VTS provider", and the resolution's aims to unify its diverse services within a VTS, leaving behind the three differentiated types: information, organization and assistance. The forecast for the next phase is that the Maritime Safety Committee (MSC) will approve the proposal and the IMO Assembly on its 32nd session, will adopt it by 2021.

Through this process, the new Resolution will be more concise and internationally adaptable, in accordance with our current needs. This paper will deal with the further revision and update of the Resolution that has initiated 4 years ago. Illustrating in one hand the slowness of legislation and the even slower nature of the maritime sector and in the other hand a suggested interpretation of the future requirements that international navigation will pose to the traffic management.

Keywords:

VTS; IMO Resolution; IALA.

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INTRODUCTION

The recognition of the International Maritime Organization (IMO) in 1985, and the publication of the first guidelines via Resolution A.578 (14) [2], was a definitive stage for the Vessel Traffic Services. In 1997, 12 years later, this resolution was revoked and a new one was adopted, the Resolution A.857(20) [1] but there have been no more revisions or modifications published since then. However, the maritime sector has demanded an urgent update.

The Maritime Safety Committee (MSC) and the IALA, through the expertise of the VTS Committee, have been working on the revision since 2018, seeking to provide a clear framework to operate VTS globally and in accordance with our times.

1. BACKGROUND OF THE VTS SYSTEM.

The origin of what is formally understood as a maritime traffic surveillance system dates back to 1946, when the first experiments of combining radar screen equipment with the transmission of radio messages referring to navigation in real time were recorded at the port of Liverpool, UK. The development of radar during the Second World War made it possible to monitor and accurately track maritime traffic, and its civil applicability was first utilized in Douglas, Isle of Man, 1948 (Hughes, 2009) [3]. Months later, in July, more sophisticated equipment was installed in the same port of Liverpool and, by 1950, other ports, including Long Beach, California, and Rotterdam were also provided with this new device.

At that point it was seen as a powerful tool to facilitate operations, reduce delays and increase the efficiency of port traffic flow. Gradually, radars were installed in various European ports such as Amsterdam in Holland, Le Havre in France, Southampton in England and Halifax in Nova Scotia. By the sixties there were centres distributed across Europe and North America and, by the seventies, in Japan. Currently, forms of VTS, although not standard throughout the world, are found in the littorals of all continents in countries including: China, Egypt, Hong Kong, South Africa, all European countries including the Baltic, Atlantic and Mediterranean coasts, the Arabian Peninsula, the Black Sea, the USA and Canada.

Whilst the *hardware* up to this point was Radar and the marine-band Very High Frequency, VHF, radio provided by VTS centres, the *software*, meaning guidelines or regulations, did not appear until more than thirty years later.

It has been established that the first official recognition of the VTS system by the IMO was not until 1968. At the time it was the IMCO, Inter-Governmental Maritime Consultative Organization, which adopted, through the Assembly of the Maritime Safety Committee, the Resolution A.158 (ES. IV) [4] and this recommendation was received by ports as a valuable contribution to port safety and its approaches. In this sense, it promoted two points addressed to governments in favour of safety: one which is particularly relevant for oil terminals or dangerous goods; and the second being the use of the ETA, Estimated Time of Arrival, which also helps to manage the arrival of ships. The birth of the principles that have been maintained to support the VTS service can be seen to contribute to safety, increase efficiency and also protect the marine environment, although, in the sixties, it specified only the cases of operations in oil terminals and ports where noxious or hazardous cargoes were loaded and unloaded.

The first guide for VTS came 17 years after initial recognition, when a new Resolution was issued. The IMO Resolution A.578(14) in 1985 [2], in terms of the Guide for VTS, highlighted the need for ships to report ashore when approaching a port and within territorial waters: in narrow channels, in areas of heavy traffic, when dangerous goods are involved or in sensitive areas. In general, operational procedures and VTS planning were outlined. And, most importantly, international treaties concerning safety, the International Convention for the Safety of Life at Sea, SOLAS, were addressed within Chapters IV and V, Communications and Safety, respectively.

The second and last direct resolution of the IMO was in 1997, 12 years later, when the Guide for VTS version was revised through the Resolution A.857(20) [1].

2. THE RESOLUTION A.857(20). 1985-1997.

This resolution revoked the first guidelines for VTS version and, generally, it was more extensive and precise, went from having 17 pages to 22. Two annexes were added, some technical criteria concerning VTS and, addressed for the first time, the hiring procedures, necessary qualifications and training of the personnel that operates within the VTS centres.

This was adopted after other important publications, including the first edition of the VTS Manual, came from the IALA in 1993. So the resolution included, for the first time, the IALA Manual as a complement to the guidelines of the resolution itself. Also, the Resolution MSC.43(64) [7], Guidelines and criteria for Ship Reporting Systems, SRS, adopted in 1994, was included.

The main points of the resolution that have been proposed to be changed are those that have been considered over the years obsolete or superseded, overly detailed, unclear, misunderstandings or open to differing interpretation. With these parameters, seven out of ten definitions, according to Annex 1, point 1, will need to be modified.

The Vessel Traffic Service, *VTS* defined at point 1.1 as: “a service implemented by a Competent Authority, designed to improve the safety and efficiency of vessel traffic and to protect the environment. The service should have the capability to interact with the traffic and to respond to traffic situations developing in the VTS area”.

The *Competent authority* in 1.2: “the authority made responsible, in whole or in part, by the Government for safety, including environmental safety, and efficiency of vessel traffic and the protection of the environment”. 1.3 defines *VTS authority*: “the authority with responsibility for the management, operation and coordination of the VTS, interaction with participating vessels and the safe and effective provision of the service”. 1.4 defines *VTS area*: “the delineated, formally declared service area of the VTS. A VTS area may be subdivided in sub-areas or sectors”, depending on factors such as traffic density, traffic patterns, type of service requirements and surveillance. In 1.6, the *VTS operator* is defined as: “an appropriately qualified person performing one or more tasks contributing to the services of the VTS”. 1.10 defines *Allied services*: “services are services actively involved in the safe and efficient passage of the vessel through the VTS area”.

Within point 2, *General considerations for VTS*, the services that are rendered by a VTS are described in point 2.3 and three types of services are identified: The Information Service, INS, the Traffic Organisation Service, TOS and the Navigational Assistance Service, NAS.

These services are directly linked to Chapter 4 of the VTS manual of the IALA and, according to Resolution A.857(20), two types of VTS are described: i) Coastal VTS: Control of maritime traffic in a determined area, which includes traffic in Traffic Separation Scheme (TSS), regulated by the IMO, and can be found in Spain, for example, as the Finisterre VTS which controls the Finisterre TSS. ii) Port VTS: Mainly dedicated to port entry and departures. It may be the case that the same VTS centre exercises Coastal and Port control.

3. THE NEW RESOLUTION ON GUIDELINES FOR VTS. 1997-2018.

Since 1997, more than 20 years have passed and, during this time, important matters have occurred. Some of the most important, in relation to the maritime sector and influence on the VTS system, include; the implementation of the Automatic Identification System (AIS) on board ships, the creation of the Safe Sea Net (SSN) [8] and later the European Maritime Safety Agency (EMSA) [9], and the concept of e-Navigation [10] that is increasingly necessary to incorporate the rapid developments of new technologies and their potential use.

Governments, organisations and different stakeholders, within the international maritime domain, have pointed out the need to update the resolution.

IALA, through the expertise of the VTS Committee and a correspondence group (over 30 committee members from 20 organizations, representing competent authorities, VTS authorities, sister organizations and industrial members), has taken a coordinating role in the preparation of a new revised Resolution for submission to the IMO [11].

The first process review was initiated under the work program of 2014 to 2018. In 2016 the VTS Committee commenced the development of an unplanned output proposal for the IMO. In February 2018, a proposal for a new output for a revision of the resolution was submitted to the Maritime Safety Committee in its 99th session, (MSC 99/20/3) [12]. In April 2019, the MSC published the progress on the review via MSC 101/23/11 [13] and, in June, the IALA hosted a seminar at its headquarters on updating the resolution. IMO Member States, IALA members, international organizations and other stakeholders were informed and invited to participate in the draft version. In September IALA held the VTS47th session [14] with the aim of finalizing the review. The VTS Committee will have finalised the draft revision for submission to the IMO-Sub-Committee on Navigation, Communications and Search and Rescue (NCSR), 7th session by January 2020.

In reference to the main points that will be subject to modifications, within the definitions are, in order of appearance: The Vessel Traffic Service, *VTS* will be implemented by a Government, instead of “a Competent Authority”. This is directly allied to point 2: *Competent Authority*. The term “Authority” raises semantic bewilderment in confusion over what is formally understood as an "Authority" and the one that is "Authorized" to exercise a function, in this case that of VTS. To avoid translation differences, the body that exercises the VTS service will be called "the VTS provider", a more accurate phrase denotation in a domain of shared sociolinguistics, (the English language). So, the *Competent Authority* will be the authority made legally

responsible by the Government for vessel traffic services and the *VTS authority* (point 3) will be the *VTS provider* which will mean the organisation or entity legally empowered by the Government or Competent authority for the provision of a vessel traffic service. The *VTS area* means the delineated, formally declared area in which the vessel traffic service provider is legally empowered to deliver the service. The compound expression of "service area" will be separated, with the understanding that the service is already provided in the area and, therefore, is redundant. The subdivision of area into sub-areas or sectors will also be eliminated in this definition the *VTS personnel* instead of *VTS operator* (point 1.6), so that the functions do not fall according to the tasks to be performed, but on the qualifications held. In this way, more importance is given to training. The definition 1.10, *Allied services*, denotes the word "allied" to mean services, other than a vessel traffic service, supporting vessel traffic since safety and efficiency are already part of the functions of a VTS.

One of the most substantial changes will refer to the three types of services that are rendered by a VTS. The INS, TOS and NAS were used to differentiate the degree of interaction of the VTS with vessels and, furthermore, with the type of VTS, since the TOS and NAS services are associated with the Port or Harbour VTS, whilst the INS is with the Coastal VTS. However, these are not being recognised by mariners who are the primary recipients of VTS, nor is the common understanding among VTS experts on the interpretation and the practical use of the three types of services. The word "Service" after each type of service was found to be the cause of current confusion. One of the authorities' main concerns is that these services are not declared or delivered consistently worldwide, while ships navigate in different VTS areas. VTS are delivering navigational assistance and traffic organisation without declaring the services. The aim is to exclude the types of VTS service in the revised resolution., to harmonise the interpretation and provision of vessel traffic service worldwide and understand that there is, in fact, only one "service" provided by a VTS. The service (not plural) consists of maritime information, monitoring, management and organisation of vessel traffic and navigation assistance [15].

Although Resolution A.857(20) included, for the first-time, guidelines on recruitment, qualifications and training of VTS Operators in Annex 2, in point 1.1.3 [sic.]: *The various levels of knowledge and skill required of the operator, and the standard of training necessary to achieve these levels, have never been fully defined on a world-wide basis. At present there are no internationally recognized qualifications for VTS operators, and the approach to recruitment and training varies widely from country to country*. So, to mitigate these variances, the existing resolution makes reference to the IALA VTS Manual, however this Manual is only updated every 4 years. In order to avoid the pitfalls caused by a lack of updating, the new resolution will refer to the suite of IALA guidance relating to VTS recommendations, guidelines and model courses that are under continuous review.

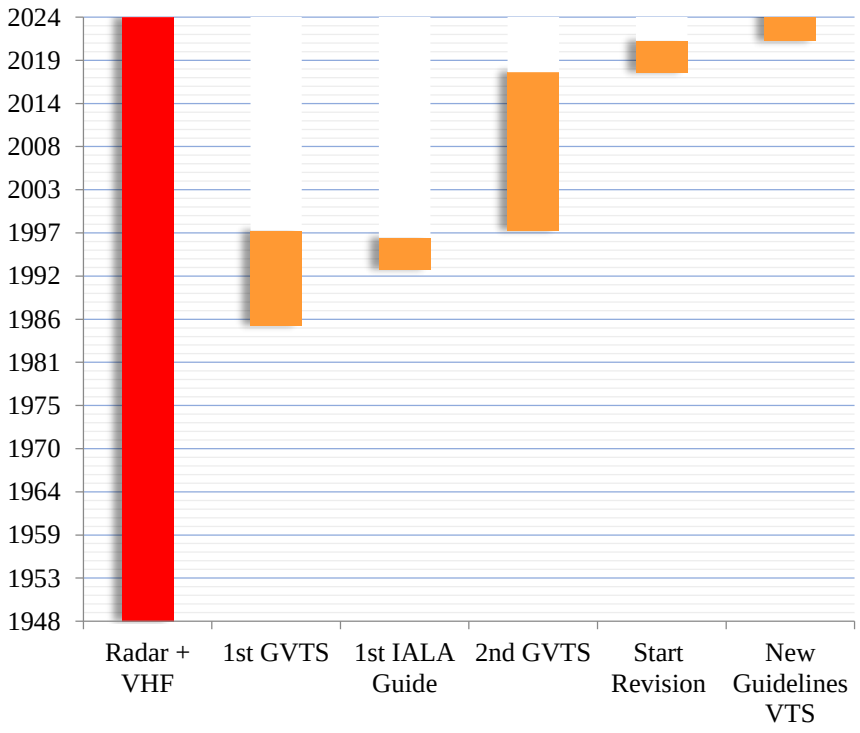
4. ANALYSIS UNTIL THE NEW RESOLUTION IS PUBLISHED. 2018-2021.

Since the review work began in June 2018, more than 15 meeting have been held. The next steps are for approval at IMO MSC 102 in May 2020, and then adoption at IMO Assembly 32 by autumn 2021 with the new resolution published in December.

IALA has developed a complete set of training recommendations, guidelines and model courses that will be ready and effective when the new resolution is published.

As stated above, all the *software* will be ready and updated, but the *hardware* of the VTS centres remains the same. Figure 1 shows the main means for a VTS in red colour versus the referring guidelines in orange through the years. GVTS as IMO Guidelines for VTS. After more than 50 years, only radio and radar are considered in the profession of VTS. Although, with the obligatory use of the AIS on board vessels, according to SOLAS Convention, Chapter V Regulation 19 *Carriage requirements for shipborne navigational* [5], certain ships will have been fitted with an automatic identification system (AIS) not later than 2008. Consequently, this is also observed as an essential tool for the control of the traffic from shore. It is recognised by Resolution MSC.74(69) [16] of 1998 that the AIS should improve the safety of navigation, aiding the efficient navigation of ships, the protection of the environment and the operation of vessel traffic services (VTS). AIS was defined as a VTS tool, that is, from ship-to-shore for traffic management.

Figure 1. Radar and VHF versus guidelines for VTS.

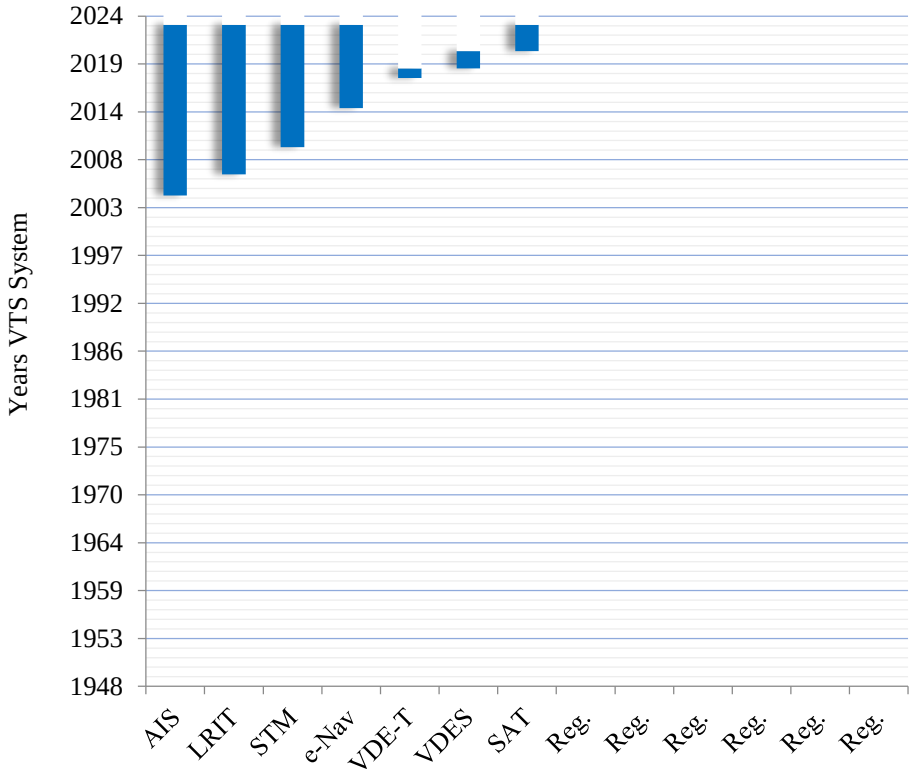


Source: Own elaboration.

In the same way that the AIS device cannot be understood without an ECDIS, a VTS Operator must use an electronic chart, although the technology of integrating the AIS signal into a radar exists. According to figure 3, Annex 2 of the present resolution, the components included are radar, radio, circuit TV, visual, Telex, phone, computers and others. There are no references to AIS, VHF with Data Exchange (VDES) [17], ECDIS or any electronic chart, nor of AIS with satellite signal. The phone is no longer utilised without a system connected to Internet messaging through an app. Geolocations are used as a means to transmit one position near the coast ship-to-shore. The “others” mentioned in Annex 2 may cover this omission of equipment but, in time, it must be rectified by inclusion in the regulations.

The figure 2 shows future means for VTS that some already use versus regulations (Reg.) limbo for them.

Figure 2. Future means for VTS versus regulation limbo.



Source: Own elaboration.

Legend: AIS: Automatic Identification System. LRIT: Long-Range Identification and Tracking. STM: Sea Traffic Management. e-Nav: e-Navigation. VDE: VHF plus Data Exchange System (DES). VDE-T: VDE-Terrestrial. VDES: VDES-Terrestrial with Application Specific Message (ASM). SAT: VDES including the Satellite frequencies. Reg.: There is no regulation of these means referenced for VTS.

5. CONCLUSIONS.

All these efforts seek to ensure that the resolution serves as an effective instrument, providing a framework to implement VTS globally in a harmonised manner and that it responds to significant global changes since its adoption in 1997. It has been the work, so far, of 24 years. Although the result will be an effective instrument, it is worth noting what this long process has meant. New resolutions, updates and revocations that require so many years to be published, could risk being ineffective.

The present resolution refers to a number of instruments which are now incorrect, obsolete or redundant and requires updating. The document will also benefit from overall rationalisation and restructuring.

IALA has developed a complete set of training recommendations, guidelines and model courses, and so ensuring that details of VTS operations and training refer to the IALA Standards and Guidelines related to VTS, is an advantage. Thus, the IALA appeal formula will facilitate future updates.

The new resolution and guidelines are not foreseen to have a negative impact on VTS technology. Once implemented, the resolution will, however, strengthen the link between the IMO Guidelines and the existing IALA standards on VTS technology.

It should be borne in mind that new challenges are approaching that will have to be addressed. The global maritime fleet continually increases, and the maritime sector needs to unify and standardise procedures and processes optimising connections to the logistic chain between ports. Recognition of the role and increasing position of VTS is necessary since governments are recommended to implement such a service.

Globalisation and the widespread use of the internet are changing global perceptions and strategies. That is why the concept of e-Navigation has emerged. Unmanned vessels and drones will be increasingly common. Satellites bring both detection technology and communications, and all will interact with the VTS system in the near future. Surface picture worldwide maritime traffic, the capability to monitor and analyse wider traffic images, is already tangible.

Finally, environmental awareness has increased proportionally with concerns to protect the planet and increasing measures of marine protection will be required in each new procedural update.

References:

[1] International Maritime Organization. *Guidelines for Vessel Traffic Services* [online] *: resolution A.857(20) adopted on November 1997*. London: IMO, 1997 [Date of access: 06 July 2020]. Available to: <http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Assembly/Documents/A.857(20).pdf>

[2] International Maritime Organization. *Guidelines for Vessel Traffic Services* [online] *: resolution A.578(14) adopted on 20 November 1985*. London: IMO, 1986 [Date of access: 06 July 2020]. Available at: <http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Assembly/Documents/A.578(14).pdf>

[3] Hughes, T. Vessel Traffic Services (VTS): are we ready for the new millennium?. *Journal of Navigation*. September 1998, Vol. 51, n. 3, p. 404-420. ISSN 14697785 [Date of access: 6 July 2020]. Available at: <https://doi.org/10.1017/S0373463398007954>

[4] International Maritime Organization. *Recommendation on port advisory services* [online]*: resolution A.158 (ES.IV)*. London: IMO, 1968 [Date of access: 08 July 2020].

Available at: <http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Assembly/Documents/A.158(ES.IV).pdf>

[5] International Maritime Organization. *International Convention for the Safety of Life at Sea*: *SOLAS*. London: IMO, 2004.

[6] International Association of Lighthouse Authorities. *VTS manual* [online]. 6th ed. Saint Germain en Laye: IALA, 2016, 125 p. [Date of access: 08 July 2020]. Available at: https://www.iala-aism.org/product/iala-vts-manual-2016-digital-copy/

[7] International Maritime Organization. *Guidelines and criteria for ship reporting systems* [online]: *resolution MSC.43(64)*. London: IMO, 1994, 9p. MSC 64/22/Add.1 [Date of access: 08 July 2020]. Available at: <http://www.imo.org/blast/blastDataHelper.asp?data_id=15404&filename=43(64).pdf>

[8] Europe. Parliament. Directive 2010/65/EU of the European Parliament and of the Council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC: text with EEA relevance. In: *Official Journal of the European Union* [online]. 29 October 2010, p. 1-10 [Date of access: 08 July 2020]. Available at: <https://eur-lex.europa.eu/eli/dir/2010/65/oj>

[9] Europe. Parliament. *Regulation (EC) No 1406/2002 of the European Parliament and of the Council of 27 June 2002 establishing a European Maritime Safety Agency [online]: text with EEA relevance*. 5 August 2002, L208, p.1-9 [Date of access: 08 July 2020]. Available at: <https://eurlex.europa.eu/legal content/EN/TXT/?qid=1594390814045&uri=CELEX:32002R1406>

[10] International Maritime Organization. *Development and implementation of e-navigation*: *MSC 94/18/8*. London: IMO, 2014.

[11] International Association of Lighthouse Authorities. *Draft revised assembly resolution on guidelines for vessel traffic services* [online]: *VTS46-13.2.5: revised resolution post VTS46, Version 2.3.1* [Date of access: 08 July 2020]. Available at: <https://www.iala-aism.org/content/uploads/2019/01/VTS46-13.2.5.-Draft-Revised-Resolution-Guidelines-for-VTS.pdf>

[12] International Maritime Organization. *Proposal for a new output for a revision of resolution A.857(20) on Guidelines for Vessel Traffic Services: MSC 99/20/3*. London: IMO, 2004, 2018

[13] International Maritime Organization. *Progress on the review of the Guidelines for Vessel Traffic Services* [online]*: resolution A.857(20*). London: IMO, 2019, 3 p. MSC 101/23/11 [Date of access: 10 July 2020]. Available at: <https://www.iala-aism.org/content/uploads/2019/01/MSC-101-23-11-Progress-on-the-review-of-the-Guidelines-for-Vessel-Traffic-Servicesresolution-A.85720-IALA-1.pdf>

[14] Gregory, K., Southall, T. IALA VTS Committee report In: *47th session of the iala vessel traffic service: 23 to 27 September 2019.* Saint Germain en Laye: IALA, 2019, p. 1-42.

[15] Southall, T. *Revision of IMO Resolution A.857(20) Guidelines for Vessel Traffic Services* [online]*: Seminar Report: 26 -27 June 2019*. Saint Germain en Laye: IALA, 2019, 31p. [Date

of access: 10 July 2020]. Available at: https://www.iala-aism.org/product/seminar-on-the-revision-of-imo-resolution-a-85720-guidelines-for-vts/

[16] International Maritime Organization. *Adoption of new and amended performance standards* [online]*: resolution MSC.74(69) : adopted on 12 May 1998.* London: IMO, 1998, 20 p., MSC 69/22/Add.1 [Date of access: 08 July 2020]. Available at: <http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Maritime-Safety-Committee-(MSC)/Documents/MSC.74(69).pdf>

[17] International Association of Lighthouse Authorities. *The Technical specification of VDES* [online]*: G1139*. Saint Germain en Laye : IALA, 2019. p. 15-127 [Date of access: 08 July 2020]. Available at: https://www.iala-aism.org/product/g1139-technical-specification-vdes/