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Report 13th VTS Symposium
Sustainable Safe Navigation

VTS2016 Report

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Report of the 13th International VTS Symposium
'Sustainable Safe Navigation'

Executive Summary

The 13th International VTS Symposium – 'Sustainable Safe Navigation' was held from 8 – 12 August 2016 at the Kuala Lumpur Convention Centre, Kuala Lumpur, Malaysia, hosted by the Marine Department Malaysia.

The Symposium was attended by 377 delegates of which 120 exhibitors plus many staff from the host country.

The delegates represented 37 countries, of which 33 were IALA National Members. The associated exhibition attracted 15 Industrial Members, displaying the latest developments in VTS.

A series of 55 presentations were given under eleven broad headings:

- VTS – Future trends
- International framework for VTS and National Regulatory Provisions
- Where e-navigation meets VTS
- The role of VTS in Incident Response
- VTS simulation and training
- Training and Competency – is the shore lagging behind the bridge?
- Technology in VTS – What's next?
- Decision support tools in VTS
- VTS communications
- Exchange and management of data and information
- VTS Best practices

The Symposium also saw the publication of the sixth edition of the IALA VTS Manual.

The results of the VTS Questionnaire were presented.

The Symposium identified 11 conclusions.

The two nominated best students of the World-Wide Academy Level 1 AtoN Manager courses had their certificates remitted by the IMO Secretary-General Mr Lim Kitack on the opening day.

There were five signing ceremonies during the Symposium, related to AtoN training, e-Navigation Underway conferences for the Asia-Pacific region and the organization of the 19th IALA Conference in the Republic of Korea.

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Report of the 13th International VTS Symposium
'Sustainable Safe Navigation'

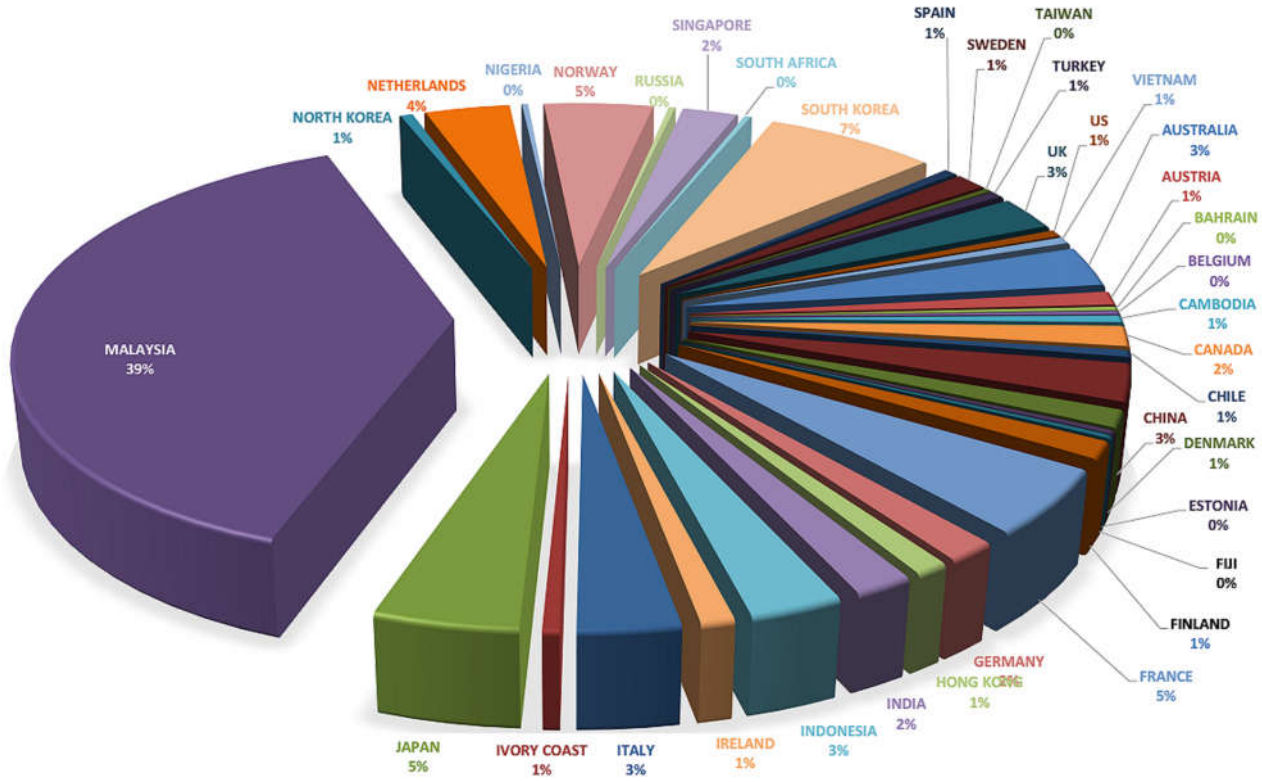
1. INTRODUCTION

The 13th International VTS Symposium was held from 8 – 12 August 2016 at the Kuala Lumpur Convention Centre, Kuala Lumpur, Malaysia, and was hosted by the Marine Department Malaysia. The theme for the Symposium was 'Sustainable Safe Navigation'.

The Symposium was attended by 377 registered delegates of which 120 exhibitors plus many staff from the host country.

The delegates represented 37 countries, of which 33 were IALA National Members. The associated exhibition attracted 15 Industrial Members, displaying the latest developments in VTS.

A list of participants is included at ANNEX A.



2. OPENING SESSION OF THE SYMPOSIUM

At the commencement of the opening the guests and the delegates were entertained with an opening dance by children of Ekatari.

2.1 Welcome from Malaysia – Dato' Baharin Bin, Director General Marine Department Malaysia

The Director-General of Malaysia's Marine Department, Dato' Baharin Bin, emphasized the importance of the 13th International Vessel Traffic Services Symposium of IALA taking place in Kuala Lumpur and the commitment of the Government of Malaysia to VTS as a significant tool to manage vessel traffic including vessels in transit in Malaysian waters. His country was a proud member of the IALA Council and also a committed Member State of the International Maritime Organization (IMO) and had been an active member of IMO's Executive Council (re-elected every two years) for the past decade. Of particular relevance among IMO's regulatory instruments was SOLAS Regulation V/12 concerning the establishment of VTS for safety and efficiency of navigation or for protection of the environment, and the Guidelines on Vessel Traffic Services. First adopted in 1968, the latter Guidelines were superseded by the Revised VTS Guidelines, adopted by way of IMO Assembly Resolution 857 and including Guidelines on Recruitment, Qualifications and Training of VTS Operators.

He confirmed that the Symposium had attracted well over 260 delegates from over 30 countries and 24 exhibitors and expressed his sincere thanks to all of them for traveling to Kuala Lumpur. He further stated his deep gratitude to all those principals and staff from the Malaysian authorities who had worked so hard to organize the Symposium. He also thanked Malaysia's local and international industry partners for their tremendous contribution.

He then briefly recalled milestones in Malaysia's provision of aids to navigation and related services including VTS. Malaysia's oldest lighthouse, located on Undan Island in the Malacca Strait, was carefully preserved as part of its national heritage. Delegates participating in the planned visit to the VTS centre of

the fast growing Port Klang on Malaysia's west coast would be very impressed by its state-of-the-art facilities.

The full text of Dato' Baharin Bin's address is at ANNEX B

2.2 Welcome from IALA – Mr Francis Zachariae, Secretary-General International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA)

IALA Secretary-General Francis Zachariae welcomed everybody and thanked the Marine Department of Malaysia in particular for the impressive, high standard of the organisation of the Symposium as well as the outstanding cooperation extended to the IALA Secretariat and the wonderful generosity. Special thanks were due to Capt Mohamad Halim bin Ahmed, Director, Safety of Navigation Division, Malaysia. He also thanked Mr Tuncay Çehreli, Chairman, IALA VTS Committee for his insights in helping to draw up the programme of the Symposium, and all the exhibitors including IALA's Industrial Members for bringing such a good show to Kuala Lumpur.

He then proceeded with presenting in some detail his views on VTS and where it was heading in the future, also in the light of new developments relating to e-Navigation. VTS had evolved over many decades and, with the more recent developments in e-Navigation, had an important role to play as "the front office" of e-Navigation. Both VTS and e-Navigation aimed at helping mariners in their navigational tasks, and the best way to provide this assistance was through streamlining standards and harmonizing practices. Harmonization had always been the principal objective of IALA's technical work. The beauty of harmonization was that it eliminated ambiguity over what standards and procedures applied, and this meant that there could be no confusion on the part of the end user – i.e. seafarers – over what was expected.

The Symposium's programme appropriately included a session on the relationship between VTS and e-Navigation. One of the main conclusions of the 2012 International VTS Symposium held in Istanbul, Turkey had been that VTS had become firmly established as a focus for information exchange. This role continued to expand and this would increasingly impact on e-Navigation, and, vice-versa, e-Navigation developments would impact on VTS. He saw VTS as playing an enhanced, central role in safety of navigation and maritime traffic as the utilization of the sea became more multi-faceted and complex as a result. The full potential of VTS had yet to be realized, and he believed that e-Navigation would help to maximize the benefits of VTS.

As regards the chosen Symposium theme of "Sustainable Safe Navigation", he commented that sustainability was not just a buzz-word but, in the maritime context, highlighted the dynamic – and often "stressed" – nature of the interaction between commercial gain and investment in safety. A balanced approach was needed and in this regard concepts of domain awareness and marine spatial planning were increasingly relevant, as was a greater focus on risk assessment. The latter should concentrate in particular on the all-important human element. VTS had an important role to play in detecting, targeting and managing the human element where it posed a risk to navigational or traffic safety, and this role extended to maritime emergency response and crisis management – an aspect of VTS to which the programme quite appropriately devoted a whole technical session.

The full text of Mr Francis Zachariae's address is at ANNEX C.

2.3 Keynote address – Mr Kitack Lim, Secretary-General International Maritime Organization (IMO)

IMO Secretary-General Kitack Lim started off his Keynote Address by thanking the Marine Department of Malaysia and the Transport Ministry for hosting the prestigious Symposium and inviting him. He congratulated IALA on its initiative once again to hold an international symposium on VTS and acknowledged IALA's valuable contribution to the work of the IMO, the association having enjoyed consultative status at the IMO since 1961. As he himself had been in charge of a major port in his country of origin (Port of Busan, Republic of Korea), prior to his appointment as IMO Secretary-General, he had come to value the distinct role of VTS in many aspects and which, in his view, was crucial in preventing navigation-related accidents in ports and coastal waters. Shipping companies would do well to be aware of this preventative role, which was also important in the context of the imminent entry into force (on 1 January 2017) of IMO's new Polar Code concerning safe navigation in the waters of the two Polar Regions. SOLAS Regulation V/12, importantly, outlined the role of Governments (as SOLAS Contracting Parties) in the establishment of VTS and made it clear that the decision regarding the provision of VTS was the responsibility of the national authorities concerned.

Commenting on the Symposium's theme of "Sustainable Safe Navigation", he drew attention to the post-2015 United Nations Agenda for Sustainable Development, with a set of clearly stated Sustainable Development Goals (SDGs) for 2030. Most of the Agenda's elements would only be realized with a sustainable maritime transportation system supporting world trade and facilitating the global economy. Seen in this context, safety of navigation at sea – protecting people and ships, preventing collisions and other accidents and thereby protecting the environment – was a vital element in maintaining the sustainability of shipping.

The Symposium offered ample opportunity to discuss what technology and innovation had to offer and how VTS might look in the future and ways to ensure sustainable safe navigation. IMO's strategic plan on the implementation of e-Navigation included a priority task relating to improved communication of the VTS service portfolio (the so-called Maritime Service Portfolios or MSPs). This task needed to identify the possible communication methods that might be used and the test beds that might need to be built to demonstrate which systems are best in different areas of operation, such as deep sea, coastal, and port areas. The extensive use of new information and communication technologies provided exciting opportunities for enhanced interaction and information sharing, not only between ships and shore-based authorities, but also with and between many other stakeholders.

He emphasized the importance of capacity building and training for competency development and in this regard praised the work of IALA's World-Wide Academy. He further highlighted the excellent, collaborative initiative of the joint Japan-ASEAN project for a new, regional training centre at Malaysia's Maritime Transport Training Institute (MATRAIN). He also spoke about the importance of building on the experience gained with the Marine Electronic Highway in the Straits of Malacca and Singapore. This included VTS to assist safe navigation through a defined part of the Straits, a network of electronic navigational charts using electronic chart display and information systems (ECDIS), and environment management tools, all combined in an integrated platform covering the Straits to allow optimal information to be made available both to ships and shore-based users.

The full text of Mr Kitack Lim's address is at ANNEX D.

2.4 Opening speech – Datuk Ab. Aziz Kaprawi, Deputy Minister, Ministry of Transport Malaysia

The Opening Address first conveyed a message of warm welcome from Malaysia's Transport Minister, who also thanked everyone for their attendance or their involvement in the organization of the Symposium.

It then drew participants' attention to the importance of VTS to Malaysia as a maritime nation with fast developing ports. The first VTS centre in the country had been established in Bintulu Port in East Malaysia (Sarawak) in 1982, which served the important gas tanker traffic related to the country's energy economy. Another noteworthy milestone had been the establishment of the IMO-mandated ship reporting system STRAITREP for the Malacca Straits. More recently, the Government had decided to go ahead with large-scale new investment in the VTS infrastructure at Port Klang on Malaysia's west coast, including a vessel traffic information and monitoring service and VTS personnel training.

Other new developments that put Malaysia proudly at the centre of VTS training concerned the scheduled start, in mid-2017, of the first VTS personnel training programme at Malaysia's Maritime Transport Training Institute (MATRAIN, located in Klang, Selangor), which will serve as a regional training centre under a cooperative project of Japan and the Association of South East Asian Nations (ASEAN). Recently, the Government also acquired an 85-metre long buoy vessel to serve as aids to navigation and VTS personnel training ship.

The full text of Datuk Ab. Aziz Kaprawi's speech is at ANNEX E.

2.5 Official opening of the Symposium

Datuk Ab. Aziz Kaprawi officially opened the Symposium by ringing a ship bell on the stage seven times.

2.5.1 Launching Stamp VTS2016

To mark this event, commemorative stamps have been issued by Post Malaysia. The commemorative stamps symbolises the highest cooperation between Malaysia and IALA in making efforts towards “Sustainable Safe Navigation”. A symbolic post card was signed and posted on the stage by Datuk Ab. Aziz Kaprawi.

2.5.2 Launching VTS Manual and coffee table book

The sixth edition of the VTS Manual was launched followed by the presentation of a coffee table book on the Safety of Navigation Modernisation.

2.6 Opening of the Exhibition

The Exhibition was opened at the entrance of the Exhibition Hall by Datuk Ab. Aziz Kaprawi assisted by Mr Kitack Lim, Dato' Baharin bin Dato' Abdul Hamid, Mr Francis Zachariae and Capt Mohamad Halim bin Ahmed by cutting a ribbon. This was followed by visits to some of the exhibition booths.

2.7 Signing Ceremonies

On the stage in the Exhibition Hall, as part of the opening ceremony on Monday, 8 August 2016, two signing ceremonies took place, both witnessed by the Deputy Minister of Transport Malaysia and IMO Secretary-General.

- Firstly an agreement was signed between Japan Coast Guard and Marine Department Malaysia. The agreement formalises the establishment of ASEAN Regional Centre for VTS training located at MATRAIN Malaysia. The training programme aims mainly at training VTS personnel based on IALA V-103 module. The programme will be funded by Japan - ASEAN Integrated Fund (JAIF).

- Secondly a Memorandum of Understanding was signed between Marine Department Malaysia and IALA on the World Wide Academy Level 1 AtoN Manager Course.

The following documents were signed during a signing ceremony in the Plenary Hall on Thursday, 11 August 2016:

- Memorandum of Agreement between Directorate General of Lighthouses and Lightships, India (DGLL) and IALA. This agreement is an important step ahead for the delivery of Aids to Navigation (AtoN) training based on the IALA model courses. DGLL is forging ahead to be the centre of excellence in training AtoN personnel and with that to significantly contribute to the safety of navigation in the region.

- Framework Agreement between the Ministry of Oceans and Fisheries (MOF) of the Republic of Korea and IALA for the preparation of the 19th IALA Conference in 2018 to be held in Incheon, Republic of Korea.

- Record of Discussion Amendment 1 on the IMCPF (IALA-MOF Cooperation Programme Fund), which is in line with paragraph 5.2 of the IMCPF MOU (Memorandum of Understanding).

2.8 WWA Certificates award giving to the Academy best students

Under the IALA World-Wide Academy Level 1 AtoN Manager Courses delivered in 2015 and 2016 two delegates were nominated as best students. The awards were given to Mr Philip Hill, of the IALA National Member in Fiji and Mr Minsu Jeon, of an IALA Associate Member in the Republic of Korea, as part of the opening ceremony in the Exhibition Hall.

The WWA Certificates were presented by the Secretary-General of IMO, Mr Kitack Lim.

Mr Philip Hill

Mr Minsu Jeon

2.9 Media

The following media reported on the opening session of the Symposium.

Electronic media	Print media
Al Hijrah TV	New States Time Press
TV9 / News	The Star
NTV7	Utusan Melayu
The Star TV	The Sun
RTM Radio	Bernama News
RTM TV	China Press
Bernama TV	Berita Harian (BH)
8 TV	Harian Metro
Laksou.com	Kosmo!
Oriental Daily	Sin Chew Daily
	Kwong Wah Yit Poh
	Nanyang Siang Pau
	Star

3. VTS INTRODUCTION

Session Chair: Captain Tuncay Çehreli, DGCS Turkey, Chair VTS Committee

3.1 Setting the scene

Presenter: Captain Tuncay Çehreli, DGCS Turkey, Chair VTS Committee

Mr Cehreli briefly set out the history of the establishment of VTS systems and then proceeded with highlighting the technical work of IALA's VTS Committee since its formal establishment in 1981, though IALA had been associated with VTS for much longer, nearly 60 years. The responsibilities of the VTS Committee ranged from providing sound and timely guidance and advice to those involved in VTS to developing and updating IALA documentation and the holding of relevant workshops and seminars that could inform of the development or review documentation (i.e. IALA Recommendations and Guidelines and other materials, such as manuals and model courses). The Committee usually worked through three working groups covering, respectively, Operations, Technology and Training. More recent examples of the many tasks under its current work programme (2014-2018) included the finalisation of new IALA Guidelines relating to marine casualty / incident reporting and recording, including near-miss situations as it relates to VTS. Updating IALA VTS Manual in every four years as to be launched at the VTS Symposiums is an ongoing work for the VTS Committee. Human factors were also on the agenda as a work item for development guidance. An important workshop on common phraseology and procedures for VTS communications was scheduled to take place in Bali, Indonesia from 20 to 24 February 2017, with also a technical visit to the Lombok VTS centre planned.

3.2 A Global View of VTS – Preliminary Results from the IALA VTS Questionnaire

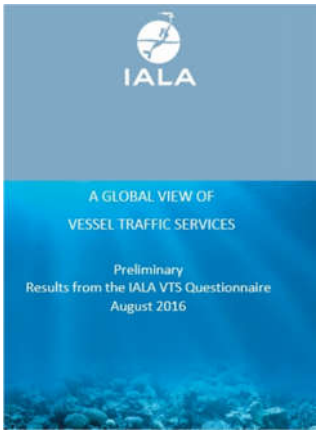
Author and presenter: Mr Neil Trainor, AMSA Australia, Vice-Chair VTS Committee

Neil Trainor presented the Preliminary Results of the IALA VTS Questionnaire based on the responses received. Key points included:The Questionnaire was initiated by the IALA VTS Committee as part of its 2014-2018 Work Programme. The Questionnaire is web-based and was released by IALA in April 2016.

- The data received is only analysed by IALA for statistical and research purposes and is released in a collated and anonymous manner.
- The purpose is to gather information on VTS from the Competent Authorities and VTS Authorities to:
  - gain a common understanding of the delivery of VTS worldwide
  - harmonise service quality, training and operating procedures worldwide
- contribute to the improvement of VTS related IALA documentation.
- Responses were received from 155 individual VTSs, representing 113 Vessel Traffic Authorities and 31 Competent Authorities from 31 countries.

Argentina	Australia	Azerbaijan	Belgium	Belize	Brazil	Bulgaria
Canada	Chile	Denmark	Estonia	Finland	France	Gibraltar
Hong Kong	Indonesia	Ireland	Italy	Japan	Latvia	Malaysia
Netherlands	Norway	Portugal	Romania	Singapore	South Africa	Sweden
Turkey	Ukraine	United Kingdom				

- A copy of the Preliminary Results is available on the IALA website: http://www.iala-aism.org/products/publications/233606220/preliminary-report-on-vts-questionnaire
- IALA is keeping the questionnaire open to enable Authorities who haven't already responded to do so and for those who have responded to update their responses as necessary (for example, a new VTS has been authorised). The website is: http://www.ialaquestionnaire.org/



3.3 VTS Presentation Malaysia

Presenter: Captain Mohamad Halim Bin Ahmed, Director Safety of Navigation Division, Malaysia

Mr Halim started off by presenting a short video film and then turned to safety of navigation and maritime traffic in the Malacca Strait. The establishment of VTS systems preceded the establishment, with IMO agreement, of a mandatory traffic separation scheme in 1988 – the historic Undan Island lighthouse being the oldest such aid to navigation in Malaysia and the VTS at the important gas tanker port of Bintulu being the first Malaysian VTS. Ten years later, the IMO-designated, mandatory ship reporting system STRAITREP entered into force, on 1 December 1998.

Since then, VTS systems have been established in both major and minor ports. The VTS centre in Port Klang dates from 1999 and design plans are underway for a new building at Port Klang that would serve a much extended, nation-wide system of shipping traffic monitoring. This would not be limited to the Strait of Malacca but would also cover the eastern side of the Malay peninsula and all along Sabah and Sarawak (East Malaysia). Mr Halim explained that this new project held exciting potential for propelling Malaysia into the e-Navigation age.

The latest new VTS was established in early 2016 at Lankawi, where passenger shipping has been growing steadily in recent years and also the size of passenger ships has increased noticeably.

Particularly noteworthy is also Malaysia's AIS infrastructure, providing a secondary source of information to VTS. Mr Halim explained that national AIS coverage not only took in the Malacca Strait but also Sabah and Sarawak (East Malaysia).

Technical Sessions

4. TECHNICAL SESSION 1 – VTS – FUTURE TRENDS

Session Chair:

Captain Tuncay Çehreli, DGCS Turkey, Chair VTS Committee

4.1 Using the Route Exchange Concept in VTS – Effects on Situation Awareness

Author and presenter:

Mr Fredrik Karlsson, Swedish Maritime Administration, Sweden

Abstract:

The concept of Route exchange ship–ship and ship–shore has been elaborated in many projects and initiatives but is now on the verge of being tested and validated in a large scale all over Europe, and in cooperation with the SESAME project, hopefully also in the Singapore Strait for the next years to come. Sharing routes and voyage plans has a huge potential and might be the biggest improvement and change for the VTS operator since the introduction of AIS. This presentation discusses the impact of ship–shore route exchange on the VTS and its operations.

4.2 Convergence of VTS and e-Navigation

Author and presenter:

Mr Ómar Frits Eriksson, Chair ENAV Committee

Abstract:

Emerging e-Navigation concepts and services promise to revolutionize the way information is transferred to and from navigators on board ships as well as how such information is presented to navigators and VTS operators. There is a need to develop a roadmap for the transition from present-day VTS to a future scenario where VTS and e-Navigation concepts are fully harmonized and where any vessel, which is "e-Navigation enabled" is capable of exploiting all available information streams, anywhere in the world. On the other hand, VTS providers and other sources of information should consider making their information streams available to the maritime community as e-Navigation services. The presentation provides advice on how this can be achieved utilizing the newly developed concept of the Maritime Cloud.

4.3 VTS in the Age of the Digital Information Tsunami

Author and presenter:

Mr Dmitry Rostopshin, Transas Tech. Ltd., Russia

Abstract:

Maritime transport chain is becoming more and more digitised and interconnected. New standards and infrastructure will lead to sharing real-time information. How VTS can handle the future "information tsunami" and how the future role of VTS will change? We believe that VTS will have better and earlier information on all vessels through new practices of information sharing. The prresentation will suggest examples of data distribution according to services provided by VTS (information service, traffic organisation service and navigational assistance service). Implementation of this data exchange allows to improve safety of navigation, efficiency of port operations and protection the environment.

4.4 Planning and Handling of Shipping in the Rotterdam Area

Author and presenter:

Mr Ben Röhner, Senior Adviser VTS, Harbourmaster Policy Department, Port of Rotterdam Authority, the Netherlands

Abstract:

Fairway planning and the handling of the (seagoing) vessels which visit the Port of Rotterdam, and the relationship and role of VTS during this process were highlighted. In the Port of Rotterdam the overall planning, the administration and the admission to the port of vessels is not performed by the VTS as such, but by the central Harbour Coordination Centre (HCC). In line with the planning of the HCC the VTS is tasked with the traffic management in general and the handling of these vessels in the designated VTS area.

In the presentation the considerations and choices are explained forming the foundation for this process and approach, what the benefits are, a description of the way of working, the consequences in respect to education and training for the employees both at the HCC as well as at the VTS centre.

4.5 Discussion - Technical Session 1

The sharing of information in e-Navigation is a very important issue. There is a high demand for transportation data; stakeholders like their data as frequent as possible. Data may incur some innovative applications to make navigation safer. Should we allow data to be open to public or keep the data within the stakeholders?

In response to this question it was stated that there are different aspects of data – the 'source' or 'owner' has to make up their mind to see if the data needs to be open or not. This is related to the identity management and how that may link to the data (who are you, do you have access to my data?). On top of that is the need for authentication to verify that the 'user' can use the data. There could be data open to the general public, but other data that is only used by certain people.

Sensitive question when talking about sustainable safe navigation – we have information about the route of the vessel, timing of the vessel and sharing data. Concern is safe navigation – how do you control the information data to make sure it does not go into the wrong hands? Everyone can access the data from berth to berth – someone is giving data (real time) for safety of navigation – in some areas there may be concerns over others with the data.

Following this comment the link with the introduction of AIS was noted. This is at the core of identity management – there is a need to confirm who the data is exchanged with. As owner of the data, this needs to be confirmed. Beyond the agreement to share data, there is a need for authentication. There is a 'chain of trust' and the source of the data needs to control the destiny of the data.

Question on Sea Traffic Management – image from the Baltic Sea – who is organising the sea traffic – is there one responsible? Is there in the EU project presented a means to look at this issue?

The answer to this question is that the decision on who will do what isn't really clear yet. Sea Traffic Management (STM) will be commencing soon, and these are items that need to be answered. All vessels to join the test bed will need to agree / as well as the VTS centres. There will be a need to develop this further before the STM test beds commence.

There are lots of discussions on e-Navigation, with a key of standardisation – there should be one format for standard information. There should be one approach for information exchange. This has been worked on in IMO – it takes a long time. There is a need to have the standard put out now – before the technology overtakes the policy development.

In the absence of development of proprietary protocols there is a need for standardisation. Without a common standard, there will be proprietary elements brought in, to address the needs.

Industrial Members can work together to identify / agree on a common approach.

Many apps will be business driven, and will not go the way of IMO. Information sharing is now big money, implications have financial approaches – IMO may not have a part in this.

5. TECHNICAL SESSION 2 – INTERNATIONAL FRAMEWORK FOR VTS AND NATIONAL REGULATORY PROVISIONS

Session Chair:

Mr Neil Trainor, AMSA Australia, Vice-Chair VTS Committee

5.1 Issues About Vessel Monitoring

Author and presenter:

Mr Piero Pellizzari, Rear Admiral, Italian Coast Guard Gen. Headquarters, Italy

Abstract:

The ever-increasing use of monitoring systems in the maritime domain awareness (MDA) has drawn the attention of the international and national communities to the implications of the data coming from this "enhanced picture" and the issues concerning traffic management, especially beyond the territorial sea.

The new challenge, for National Competent Authorities, may be envisaged in the establishing and enforcing of legal regulations, and in training of personnel involved in monitoring, as well as determining limits and possible overlapping with VTS's.

The presentation means to deal with the following items:

- Brief history of VTS and VTMIS in Italy: what is the state of the art?
- Monitoring systems architecture and Coast Guard-related functions, MDA incidents and traffic management: is that a VTS affair only?
- MDA events and provision of services: legal implications in the domestic and the international framework;
- Training requirements of personnel involved in vessel monitoring;
- "VTM operator": is it a new road map for VTSO's?
- Conclusions.

5.2 Legal Aspects and Liability Issues Concerning VTS

Author and presenter:

Mr Matti Eronen, Finnish Transport Agency, Finland

Abstract:

Vessel Traffic Services (VTS) are regulated by several international conventions and regulations. These conventions and regulations lay down the services to be provided and the vessels' duties to follow the instructions given by the VTS authority. However none of them deals with liability issues, which are left to national legislation.

This is not a satisfactory situation. The international conventions and regulations should ensure uniform interpretation and implementation. The interpretation usually takes place in courts (precedent), but there

is no case law in this field. Some accident investigation reports include recommendations for the VTS authorities, which may give rules of interpretation.

The conventions include liability clauses, according to which the owners are responsible for damage caused by the vessel itself or someone working for it, but not for damage caused by a third party, AtoN etc.

My presentation will focus on the VTS services and failures to carry out the tasks. The focus lies on legal aspects and liability issues.

The main international conventions and the legal background will be introduced. The liability aspects and their relevance will be described. The main accident investigation reports and their recommendations will be mentioned. Open questions will be noted and conclusions given if applicable.

5.3 Globalisation of VTS – Giving Effect to IMO Instruments

Author and presenter:

Mr Neil Trainor, AMSA, Australia, Vice-Chair VTS Committee

Abstract:

Under the general provisions of treaty law and of IMO conventions, States are responsible for promulgating laws and regulations and for taking all other steps which may be necessary to give those instruments full and complete effect so as to ensure safety of life at sea and protection of the marine environment.

The number of VTSs is increasing worldwide with new VTS centres becoming operational each year and there is an increasing use of VTS beyond its current boundaries (e.g. regional VTS or VTS beyond territorial seas). This scenario has contributed to a growing recognition of the need for services to be delivered in a globally consistent manner in accordance with international instruments.

This presentation focuses on the international framework for the delivery of VTS and describes how Australia gives effect to SOLAS, IMO Resolution A.857(20) Guidelines for Vessel Traffic Services and associated IALA Recommendations and Guidelines through a compliance audit regime under national legislation.

It also explores possible implications of the introduction of the IMO Member State Audit Scheme to promote the consistent and effective implementation of applicable IMO instruments.

5.4 New Era in Maritime Safety: Safety Culture

Authors:

Prof. Dr. Cem Gazioglu, İstanbul University, Institute of Marine Science and Management, Turkey *(middle)*

Dr. Hasan Terzi, Çanakkale VTS Centre, DGCS Turkey *(right)*

Presenter:

Captain Tuncay Çehreli, DGCS Turkey, Chair VTS Committee *(left)*

Abstract:

In literature the history of the progress of safety can be divided into some eras. These are: technical era, human factors era, organizational or management era, integration era, adaptive era. In the evolution of safety, each period of development does not leave behind, but rather builds on, what has gone before.

Today in maritime sector when we talk about safety, the first thing that comes to mind is ISM. ISM describes almost all safety related behaviours, implementations etc. But in practice there are some problems. For example ISM describes Near Miss reporting but there are many barriers to report NMs and ISM cannot solve this problem. On the other hand ISM is only for vessels and vessel managers, there is no

any common safety system for VTS. So we need an improved safety system: Safety Culture can be the solution.

5.5 Discussion on the Establishment of the Pear River Estuary

Author:

Mr Fan Hao, Maritime Safety Administration of P.R. China *(right)*

Presenter:

Mr Zhiwei Fan

Abstract:

With the development of VTS, sharing of the data among adjacent VTS centres has become increasingly necessary for efficient vessel traffic management, thus establishment of Regional VTS Centre will be helpful to achieve this goal, and it is possible to integrate the existing adjacent VTS centres into a regional VTS centre. This document analyses the overview of the Pearl River Estuary and the management of the VTS centres around this area, discusses the necessity of establishing the Pearl River Estuary Regional VTS Centre, analyses the technique and feasibility to achieve the goal.

5.6 Discussion - Technical Session 2

Has there been any case where VTS has been identified as the cause of an accident?

No, as the accident reports are for information, and do not lay blame. But VTS has been identified within accident reports, where improvements may be beneficial. Accident reports have been identified as not being able to be used in court. But the reports do not say anything about the liability directly.

Talking about safety for industry for many years. Until now there are still accidents / ship collisions at sea. From the studies and experience, what is the main cause of marine accidents? Is it due to the rules and regulations that have been implemented not being enforced enough? Is it because the systems need to be improved? Have you come across indication because of the nautical chart?

When investigating accidents, particularly since 1997, human factors and technology are looked at. Today industries are trying to improve safety, with a culture of safety, rather than impose additional rules and regulations. This means the entire organisation – all levels – need to be implemented in the safety culture and the safety management system.

Agree the human factor element, but it is hard to dispute this when you read transport investigation reports. How to handle that? Feel there is a need for better clarity – communications; how information is transferred between ship and shore; better clarity in responsibilities both afloat and ashore.

Liability has three stages – 1 has Government or State implemented all international legislation? 2 – if so, is the system arranged according to the legislation? 3 – human factors.

If 1 is not met, the individual may have rights to sue the State. If 2 is not met – administratively not effectively implemented – this is an administrative case. 3 – it is when the person has not acted in the correct way / as required by the legislation.

There was a great overview of all the development and different systems. If you interlink the safety management systems together, would there be some benefits? On one side the countries which establish VTS / on other side companies (i.e. cruise companies) – what is the link between these in the future?

Besides having different systems, there is benefit if all systems are harmonised – similar or harmonised systems. This is the focus of a just culture (no blame culture). But there is still a lack and a strong feeling of 'blame' culture, so this is a shift that needs to happen. There needs to be a support for a just culture.

If all parties have the same data in the future (Maritime Cloud) what is the responsibility of the various players?

That is related to the 'how' you report. The data, the information. Then there is an opportunity to take from the reports for lessons learned. At the national level this is up to the competent authority – not only a VTS or an organisation. Analysis needs to be shared to support the safety culture and promote safety behaviours. There is a need for a national, legislative framework to support safety cultures / analysis of data.

It seems clear that the case has been made for revising the IMO guidelines on VTS. What may be the implication for the STCW standards requirements for information on VTS – currently STCW provides only very basic elements for VTS. The case may be made – if there is to be a revision to the STCW – should VTS personnel be included?

There is an emerging view for a need for change. There is requirement to get consensus for a need for change. Currently the IALA VTS Committee is still coming to grips with the issue.

Up until now it is firmly believed what IALA says that VTS is an AtoN. But your presentation noted that VTS may not be an AtoN. Should IALA look at this further and verify the definition of AtoN (which includes VTS)?

The speaker noted that he has advised this in the IALA Legal Advisory Panel. Believe that this should be investigated. The inclusion of VTS as an AtoN could be an issue, and there may be a need to verify the clause in the Navguide. This needs to be clarified and followed up on.

6. TECHNICAL SESSION 3 – WHERE E-NAVIGATION MEETS VTS

Session Chair:

Captain Mohamad Halim Bin Ahmed, Director Safety of Navigation Division, Malaysia

6.1 The Future of VTS – How e-Navigation Can Contribute

Author and presenter:

Mr John Erik Hagen, Norwegian Coastal Administration, Norway

Abstract:

Moving a ship from port to port is not an exclusive navigational process.

There are other processes involved, such as ship reporting, practical and economic cargo handling, cargo control, legal requirements, security etc. Moving rapidly into the digital age, the shipping industry is continuously looking for benefits from digital opportunities in order to enhance safety, efficiency, security and protection of the environment.

It is well recognized that IMO's e-Navigation concept - particularly the provision of reliable and timely data and information dissemination along with enhanced interaction between ship and shore - could contribute to:

- enhancing the safety of navigation;
- improvements in the efficiency of shipping;
- better access to sea areas and ports; and
- further development of a worldwide, sustainable maritime transportation system.

More energy, food and leisure resources will be required to satisfy the growing population of the world. Most of these demands will be met in some form using maritime transport, especially container ships. e-Navigation is expected to equip all stakeholders with effective, user-friendly, proven tools of electronic information exchange that are optimized for effective decision-making. In this respect VTS worldwide will play an increasing important role in interaction with allied and other services.

6.2 VHF Data Exchange System (VDES) – Maritime Digital Infrastructure and New Roles of VTS Centre

Author:

Mr Hideki Noguchi, Director for Coordination of International Cooperation Administration and Planning Division, Maritime Traffic Department, Japan Coast Guard, Japan *(left)*

Presenter:

Eiichi Masuda, Japan Coast Guard, Japan *(right)*

Abstract:

Implementation of e-Navigation and modernization of GMDSS are heavily relied upon digital data communication that is available seamlessly, worldwide, from SOLAS to non-SOLAS vessels, i.e. Maritime Digital Infrastructure. It is expected that VDES will take one of the means of this Maritime Digital Infrastructure.

When VDES is realized, the first thing that shore authorities should do is to build VDES shore stations and to establish VDES shore network. In order to establish VDES shore network, it is anticipated that many countries use existing infrastructure such as AIS shore network and thus VTS centre becomes the hub of VDES shore infrastructure, i.e. the hub of Maritime Digital Infrastructure. However, to be the hub does not mean simply a central point of maritime digital data or information, it adds more roles in order to ensure the appropriate and effective use of the infrastructure.

This presentation will show the feature of Maritime Digital Infrastructure that can be realized by VDES and consider the new role of VTS centre as the hub of Maritime Digital Infrastructure.

6.3 The Capabilities of e-Navigation for Future VTS

Author and presenter:

Mr Pieter Paap, Ministry of Infrastructure and the Environment, the Netherlands

Abstract:

VTS is considered to play a major role and position in the future Sustainable Maritime Transportation System (SMTS) as proposed by the Secretary-General of the IMO at the World Maritime Day 2013. Through its capabilities e-Navigation will be able to support VTS in fulfilling this role and position in a changing maritime domain. This presentation will focus on the potential enhancement and expansion of its primary, supportive and other services (Maritime Service Portfolios), their developments in relation to IALA's Strategy on future VTS and to IMO's Strategic Implementation Plan (SIP) on e-Navigation. Furthermore these developments will be connected to possible technical and operational solutions provided by e-Navigation. Finally the presented enhanced or potential expansion of VTS services and candidate solutions provided by e-Navigation will be referenced to eventual consequences such as for instance for legislation, the VTS organization (including training), responsibilities, systems, instruments, data management, procedures and shore based infrastructure.

6.4 Cooperative Human-Machine Systems Advancing e-Navigation

Author and presenter:

Mr Steve Guest, Kongsberg Norcontrol AS, Norway

Abstract:

This paper examines some of the latest activities undertaken by Kongsberg Norcontrol IT and research partners to further improve our knowledge and understanding of human-machine interaction as it relates to VTS operations and e-Navigation. Beginning with a review of the human factors studies from two research projects - D3CoS and SESAME Straits; this paper explores how human factors research can impact system design and HMI development to create a cooperative e-Navigation system that is easy to use, simple to understand, and can potentially improve the safety and efficiency of VTS operations and other services within the Maritime Service Portfolio.

The human factors research in the D3CoS project focused on VTS operator stress and demonstrated a direct connection to workload and stress. As workload increases, stress increases. And as stress increases, VTS operators focus on specific tasks while ignoring the larger VTS Traffic Image.

The human factors research in the SESAME Straits project focused on how decisions are made for voyage planning, traffic congestion situations, and fuel consumption on-board vessels. The research provided an informed basis for developing technology that will enhance and augment cooperative decision-making processes on-board vessels and in VTS centres through shared situational awareness.

6.5 Vessel Dynamic Monitoring System Based on Concepts of e-Navigation

Author and presenter:

Mr Fan Zhiwei, Maritime Safety Administration of P.R. China

Abstract:

To improve efficiency of maritime work and reduce the burden of the work, combining with the requirements of government "streamline administration and institute decentralization" and "one-stop service", the author has made a thorough bottleneck efficiency analysis on existing electronic systems of vessel traffic centre, command centre, S&R centre, such as VTS, HF/MF/VHF DSC, CCTV, grid management system, etc., illustrating the necessity of information resources integration of these systems. Meanwhile, based on the concepts of the e-Navigation and intelligent maritime, designing a "S-mode" vessel dynamic monitoring system on the basis of integration of existing systems, highlighting VTS system plays an important role of system integration. Besides, from several aspects of information flow, such as collection, integration, exchange, analysis and presentation, a thorough analysis on the system has been made. Moreover, the major and difficult problems in the process of system development have been analysed, so as to provide the argument for its feasibilities.

6.6 Discussion - Technical Session 3

From the discussion the following can be concluded.

Ships have a better situational awareness than the shore. Means have to be shared.

IMO works on the harmonization in the provision of information. This doesn't mean that the VTS should be the only provider of information to the ship (weather, tidal information, etc.). There are different providers of information but a standardized format should be used. International standards already exist, not only for the maritime domain.

At the time being there is no need for new on-board equipment to receive/exchange information but the equipment will evolve over the time and the ship owners will see their benefits (e.g. to track their ships).

7. TECHNICAL SESSION 4 – THE ROLE OF VTS IN INCIDENT RESPONSE

Session Chair:

Mr Muhammad Segar, Maritime and Port Authority of Singapore

7.1 Services for Shipping on Inland Waterways

Author and presenter:

Mr Rainer Strenge, Federal Waterways and Shipping Administration, Germany

Abstract:

The inland waterways of Germany comprise a network of rd. 7300 km. Under the framework of the European RIS (River Information Services) Directive (2005/44/EC) adopted in 2005 various services are offered to inland shipping.

Five inland VTS centres were established to ensure that skippers are getting informed about relevant information's necessary for safe and efficient navigation. All VTS centres provide a VHF-service for distributing information or warning messages and to handle distress calls within their responsible areas. In addition for the Rhine River a Reporting and Information System was introduced. Vessels carrying dangerous goods, tankers, passenger vessels etc., are subject to reporting requirements. There is an electronic data exchange between the two responsible Rhine Centres and also with neighbouring countries following the route of a particular vessel. In case of an accident special reports are created for supporting emergency and rescue forces. A special task of the Oberwesel VTS centre located at the gorge section of the Rhine, next to the famous Loreley rock, is to monitor ship movements and inform shipping about encounters on the basis of radar and inland AIS.

The presentation intends to provide an overview and an outlook about the services provided for inland vessels and the German Inland VTS Centres with regard to technical and operational aspects.

7.2 The Maritime Integrated Centres: the French System

Author:

Mr Nicolas Maire, Department of Maritime Affairs, France *(left)*

Presenter:

Mr Jean-Charles Cornillou, CEREMA, France *(right)*

Abstract:

Since the early seventies, France adopted a system based on maritime integrated centres called « C.R.O.S.S. » (Regional Centre for Surveillance and Rescue Operations). As a service provided by the French department of maritime affairs, a department of the ministry of Ecology, Sustainable Development and Energy, the CROSS fall under the authority of a Maritime Prefect. It combines the maritime rescue coordination centre (MRCC) and the Vessel Traffic Service as well as carrying out functions for the French Administration (marine pollution monitoring, fisheries monitoring, maritime safety information broadcasting).

Almost 300 men and women, from both civilian and military backgrounds, work on a 24/7 basis in the 7 existing CROSS to ensure the safety of navigation and provide rescue services. There are 5 main regional centres in mainland France and two in its overseas territories.

An integrated centre should coordinate maritime casualties in a more efficient way than separate centres (MRCC/MAS/VTS): more complete and reliable maritime information, better information sharing between services (located in the same centre), faster response of the coastal authority in case of emergency, etc.

7.3 Avoiding Collisions in a VTS Area

Author and presenter:

Mr Carlos Fernández Salinas, Spanish Safety Agency, Spain

Abstract:

IMO Resolution A.857(20) states that a Vessel Traffic Service should have the capability to respond to traffic situations developing in the VTS area. It is known that a target moving along a VTS screen does not do it arbitrarily, but obeying a series of rules, being the most relevant one the Convention on the International Regulations for Preventing Collisions at Sea (known by the acronym COLREGs), specifically its Part B, “Steering and Sailing Rules", which determines, among other circumstances, the navigation along narrow channels and traffic separation schemes. If the VTS operator ignores the COLREGs, he/she will hardly be able to detect a conflict situation at an early stage, let alone transmit some advice or instructions to solve it. Furthermore, the limitations of the current radar/AIS technology available in the VTS centres may mislead the VTS operator in certain situations. The aim of this paper is to highlight these difficulties in order to lay the foundations for effective solutions. To sum up: to facilitate the prevention of collisions and groundings, the main reason why Vessel Traffic Services exist.

7.4 Decision Support for Incident and Crisis Management (ICM)

Author and presenter:

Mr Florian A Gruber, Frequentis AG, Austria

Abstract:

At present most VTS are operated 24/7 as Mission Critical Control Centre. During normal operation traffic management is the focus. VTS operators are also trained to react on incidents and crisis including certain practiced communication procedures. Such events normally affect multiple civil areas.

Several domains centres are involved in the response like emergency’s response, public safety, defence and government. Interfaces to other domain centres are a key factor for cooperation. With its wide geographical and functional areas a VTS is a critical infrastructure.

ICM enables users in Emergency Management Centres to concentrate on managing their response and recovery procedures to restore normal services as quickly as possible. In an operational environment supported by ICM, automatic notification procedures ensure the rapid involvement and deployment of the necessary persons and emergency services. ICM records and updates all communication involving staff, emergency services and other involved external organisations, as an incident evolves.

This paper presents a maritime specific implementation of an ICM decision support tool compatible with public safety, air traffic and defence.

7.5 Analysis of Close Quarter Situations in Ushant VTS

Authors:

Mr Jean-Charles Cornillou and Mrs Jocelyn Leyssenne, CEREMA, France

Presenter:

Mr Jean-Charles Cornillou, CEREMA, France *(right)*

Abstract:

For eight years close quarter situations are recorded and reported by Ushant Traffic VTS. Feedback from companies, as well as internal feedback, are very positive for operators training and the quality system of the centre. The number of close-quarter reporting has become a real indicator of the VTS activity. Last but not least analysis of close quarter situations gives clear trends in the VTS area. There were only few statistical indications so far on ships' manoeuvring. As VTS are monitoring a small window on the wide ocean, this could be a first step to collect data on ships' behaviour.

7.6 Discussion - Technical Session 4

Noting the number of close quarters with fishing vessels what might be done to prevent fishing vessel collisions?

The basis for collision avoidance is in COLREGS. There is a need to train in COLREGS, both for VTS personnel, and also for the ship / fishing vessels. Included in the training should be the mix of traffic with leisure / recreation craft, which were not included in the study.

8. TECHNICAL SESSION 5 – VTS SIMULATION AND TRAINING

Session Chair:

Mr Jørgen Brandt, Great Belt VTS, Denmark

8.1 Simulator News – How to Build up a Solid Base of Experience

Author and presenter:

Mr Anders Johannesson, Swedish Maritime Administration, Sweden

Abstract:

The presentation is shared into two halves, where the first one is comparing the future STM concept with traditional VTS. The similarities are pointed out and it is argued that cooperation between the two activities will be beneficial for both. The second half deals with VTS operators´ experience and how to build up a solid base of positive experience by using simulator training. At the end of the presentation it will be pinpointed, that though experience in general is something positive and necessary, it can have a negative impact on the performance of the VTS work.

8.2 Regional Approach for VTS Operator Training

Author:

Mr Takeshi Tomohisa, Administration and Planning Division, Maritime Traffic Department, Japan Coast Guard

Presenter:

Eiichi Masuda, Japan Coast Guard

Abstract:

The existence of VTS operator who is certified with appropriate international standard, i.e. IALA Recommendation V-103 series, permits to provide the functional and reliable VTS operation. However, some countries have difficulties in capacity building of VTS operators due to lack of experience and facility, while some countries have already developed and established their own training centre or training course for the recruitment of VTS operators that is accredited by IALA V-103.

Considering the situation, Japan held the ASEAN-JAPAN Regional Meeting on VTS Operator Training in October 2014 with the cooperation of the IALA World Wide Academy (IALA-WWA). The meeting was aimed to increase awareness of importance and necessity for VTS and VTS Operator training in accordance with the international standards and to discuss the possibility of regional approach for VTS Operator training. The major finding of the meeting was to establish VTS operator training system in accordance with international standards by each Competent Authority in ASEAN as the ultimate goal. The meeting also reached the opinion that was to establish a regional hub for VTS training centres, for the time being, in order to encourage the establishment of national training centre of each Competent Authority.

The presentation describes a new project regarding regional approach for VTS Operator training for ASEAN country by Japan Coast Guard.

8.3 Collision Risks: is the Shore Lagging Behind the Bridge?

Author and presenter:

Dr Xavier Lefèvre, Operational advisor Signalis, France

Abstract:

Since decades the number of TSS increases considerably and consequently:

- Head on encounters disappeared significantly;
- Crossing encounters become more clear and frank;
- Overtaking encounters increased significantly.

To assess collision risks, bridge officers adapt their own criteria and safety thresholds to the encounter type, whereas VTS systems apply the basic DCPA-TCPA criterion for any encounter type, producing non-relevant alerts, especially to detect close overtaking.

Today, overtaking encounters seem to be the main cause of collisions in crowded areas while they are still difficult to detect efficiently from the shore.

In effect, due to the low relative velocity between the two vessels, they stay very close during a long time and any small change of course may cause collision.

This paper presents how Signalis deals with overtaking encounters.

8.4 A Study on the Factors Affecting VTSO Simulation Training

Author and presenter:

Burçin Erlevent, DGCS - Turkey

Abstract:

In the past two decades, rapid changes in computer technology have brought new opportunities in the ship's simulation systems as well as VTS simulators. These developments enable the creation of almost identical traffic images and environmental conditions in the simulation rooms as you would find in reality. In turn, modern simulators which have been equipped or updated by next generation devices, distinguish the importance of simulation in training more than in comparison to the 20th Century. Nevertheless, it's still possible to see various factors that affect the quality of training and performance during the simulation of VTS. In other words, besides the benefit of modern simulation technology, we also require an accurate evaluation of candidates, the preparation of scenarios in accordance with training objectives, the determining of the difficulty level of scenarios with efficient briefing – debriefing methods during VTS simulation training. This study aims to find out and analyse some of these factors to either minimize or provide certain solutions for adverse effects on training according to the experience gained so far.

8.5 Discussion - Technical Session 5

What training can be provided to the operator to handle multi-ship collision scenarios?

Overtaking can take so long that warnings only work with proper training.

What is the ideal time for an operator to stay on duty?

Staffing varies by the situation and the activity, there are no clear answers. This can even vary shift to shift.

When it comes to selection of staff for the VTS operator, is it critical that they have previous maritime experience? As an example most air traffic controllers are not pilots.

It may not be necessary to come in with experience but it must be built up. Someone with experience can be trained much more quickly.

Comments:

- Belgium operators do not necessarily have maritime experience; a Captain doesn't always make a good VTS controller.
- Singapore operators must understand the perspective of the ship, and therefore it is very critical.

What is the basic/minimal skill for the VTS operator?

V-103 and the model courses cover this without paying much attention to the level of experience coming in but rather the training they should exit with. The VTS operator requires a certain set of personality attributes as much as experience.

9. TECHNICAL SESSION 6 – TRAINING AND COMPETENCY – IS THE SHORE LAGGING BEHIND THE BRIDGE?

Session Chair:

Mr Kevin Gregory, Port of London, UK

9.1 VTS Training and Competency – Malaysian Experience

Author and presenter:

Mr Nadaraj Chidambaram, Puncak Teknologi (M) SDN. BHD., Malaysia

Abstract:

Coastal Vessel Traffic Services (VTS) have been implemented and operated widely for over one decade and numerous VTS have been installed in Malaysian Ports. In 1998 Coastal VTS in Malaysia was implemented for Surveillance, Enforcement and for Ship Reporting System known a STRAITREP in the Straits of Malacca and the integrated system is jointly operated by Malaysia Marine Enforcement Agency (MMEA) and by Safety of Navigation Division of the Marine Department of Malaysia.

The first group of VTSO's and Supervisors with nautical experience was trained back in 1998 by MSR (Maritime Safety Rotterdam) at the ALAM (Akademi Laut Malaysia) training facility. Eventually this group traditionally transferred their knowledge and experience to the new recruits by teaching them what they know by training On the Job for the last 12 years.

Planning of VTS Operator training for the VTSO's of Marine Department, Malaysia was challenging and required a professional training approach. To adapt the mandatory training, we had to consider flexibility and alternative training approaches in meeting the IALA Recommendation V103/1 Basic Training.

Abstract thinking by shore based VTSO helps the pilot/captain to take the right decisions concerning the navigation of the ship.

This paper will describe the challenges and experiences in developing VTS training and competency for VTS personnel in Malaysia. Further it provides recommendations for Malaysia VTS Authority to set up guidelines on recruitment and competency based training of VTS personnel.

9.2 VTS – Competence Training Approach, Results and Consequences

Author and presenter:

Mrs Lilian Biber, National Nautical VTS-Training Organisation (NNVO), the Netherlands

Abstract:

This presentation shows a possible way to improve the quality of training. NNVO has taken many measures to improve the quality of the VTS-training. Improvements were made in the setup of the Initial Training. This training follows a competence based approach. More dynamic teaching methods were introduced. The training is situation based and Human Factors were introduced. The redesign had consequences for rostering and the cost of the training.

Besides the redesign a new committee was introduced, the Committee of Certification and Auditing is responsible for the exams.

The Area Training (called Sector Training) is designed along the same lines. The training is competence based. Both the Initial Training and the Sector Training are accredited. Furthermore coaches and examiners are trained (calibration training) in order to improve the reliability of the appraisals.

NNVO does not play a role during the Recurrent Training other than the registration of the qualification and the distribution of the endorsement. In order to maintain the quality of the Recurrent Training audits are performed.

9.3 Improvement of the Recommendation V-103

Authors:

Mr Setsuo Akaishi, Mr Yoku Santo, Dr. Kazuki Inoue, Dr. Hideo Nishida

Presenter:

Mr Setsuo Akaishi

Abstract:

For contribution of maritime safety in the Malacca - Singapore Straits, the Project for Enhancement of the VTS System was conducted in 2009 by the Japan's Grant Aid.

This Project was to establish VTSs, VTS Centre at Batam, and VTS Sub-centre at Dumai, Indonesia.

Batam Centre was completed in March, 2012 and Dumai Sub-centre was completed in August 2015. The Japan International Cooperation Agency has been extending such technical cooperation as dispatching the experts to Directorate General of Sea Transportation. They started "Project on Enhancing of VTS Management Capacity". In this Project, training of VTS operators was regarded as the most important issue. Japan Aids to Navigation Association was carried out training over a four-year as JICA's project.

In this paper, based on our experience mentioned above, we will present suggestions for some Improvements of the V-103.

9.4 Research on the Cognitive Task Analysis (CTA) for VTSO's

Author and presenter:

Mr Eunkyo Brian Jang, Korea Institute of Maritime and Fisheries Technologies, Republic of Korea

Abstract:

Cognitive task analysis (CTA) can be defined as "a series of methods and techniques to reify the cognitive structures and processes of operators relevant to their task fulfilment".

(1) The tasks of VTSOs are complicating ones that not merely fragmentary actions but a series of various actions are carried out sequentially to achieve the performance goals.

(2) The perceptual abilities for the specific task fulfilment were emphasized in the major tasks of VTSOs from the conventional perspective. However, recently the following abilities become highlighted to VTSOs for their tasks. The abilities are as follows: situational awareness abilities for general control situations, control-related knowledge and experiences, communication skills, and decision-making and judging abilities. Such abilities require professionalism in the functions and roles of VTSOs. Taking this trend into account, VTSOs' tasks were analysed based on the CTA, which is rapidly applied as a means of analysing task fulfilment rather than the conventional task analysis method. Through this presentation, the following matters will be discussed such as the experiences of conducting task analysis aimed at most of the VTSOs (over 300) working at ports and coastal VTS centres in Korea, background theories, and applications of the

research findings. The research findings will be an important foundation which can be applied to various fields in the future. The various fields are as follows: the level of workload of VTSOs, evaluation on task fulfilment abilities, analysis on usability of control displays and devices/communication system etc., and VTSOs' employment/training/deployment.

9.5 Discussion - Technical Session 6

Have the human factors been evaluated from the user's point of view (mariner)? Pilot/Captain may want to double check the information given. Result is waste of time. May be too late to react. They have to trust the operators.

No - but many VTS operators were past mariners and they provide feedback on why the mariner is reacting the way they are, but this is not formal evaluation.

Low stress can be as dangerous has high stress, does your study calculate or study where the sweet spot is between too low and too high stress?

Not yet, however this does need to be done.

Is there a medical standard for evaluating the ability for a candidate to handle stress?

The human guidance is still being developed but it is recognized as part of human factors. The U.K. has developed one and they plan to incorporate.

The IALA VTS Committee, WG 3 would appreciate any research in order to incorporate this element.

10. TECHNICAL SESSION 7 – TECHNOLOGY IN VTS – WHAT'S NEXT?

Session Chair:

Mr René Hogendoorn, SAAB Technologies, Sweden

10.1 VDES, New Communication Technology

Authors and presenters:

Mr Stefan Bober, Federal Waterways and Shipping Administration, Germany *(left)*

Mr Peter Bergljung , Saab TransponderTech, Sweden *(right)*

Abstract:

The Standardization of VDES - state of affairs (Stefan Bober)

The concept of VHF Data Exchange System, VDES, is currently being developed at IALA and ITU.

VDES will provide additional capacity for digital data exchange in maritime communication, protect the AIS from overloading and respond to the increasing need for digital data exchange for e-Navigation and GMDSS modernisation.

Beyond the well-established voice radio communication VDES will be a cornerstone for VTS communication in e-Navigation.

The terrestrial part of VDES will support the VTS Service portfolio by reliable, global, worldwide interoperable shore and ship digital data communication, free of charge.

The satellite functions will allow for extended VTS Service areas beyond its traditional reach.

VDES prototyping work (Peter Bergljung)

Saab have been researching VDES technologies on current and concept radio platforms. Expanding future Class A AIS Systems with full VDES capability, may ensure widespread adoption of VDES. Additional types of VDES equipment with different levels of service may also be possible.

VDES test beds (Peter Bergljung)

Saab will within STM validation project provide ship and shore based VDES equipment for field testing, enabling additional communication means for better traffic management at sea. STM test beds will engage 300 vessels, 10 ports of different sizes and three shore centres.

10.2 APPS for Smartphones: The New VTS Weapon

Author and presenter:

Cdr James Crawford, Commander, Head of the Chilean Aids to Navigation Service, Chile

Abstract:

According to SOLAS Chapter V, Regulation 12, together with the Guidelines for Vessel Traffic Services, IMO Resolution A.857(20), adopted by the International Maritime Organization on November 27, 1997, a VTS is designed to improve the safety and efficiency of navigation, safety of life at sea and the protection of the marine environment, without establishing restrictions on the way to reach this goal.

Nowadays, in Chile there are more than 18 millions of active mobile phones, and sales are expected to continue growing. Considering that Chile's population is close to 17.62 million people, we can conclude that every Chilean citizen has a phone. In that way, the use of mobile phones to spread information looks like an efficient way.

Considering previous statements, DIRECTEMAR, the Chilean VTS Authority, has developed an application for smartphones, as a way to spread safety information to mariners regarding route conditions, new hazards on maritime routes or news about lighthouses malfunctioning, providing a new tool to VTS information services.

According to our experience, the use of smartphone applications emerges as an excellent tool for VTS with great potential for development.

10.3 Optical Tracking for Green VTS

Author and presenter:

Mr Michele Fiorini, Leonardo Finmeccanica S.p.A., Italy

Abstract:

Camera based vessel detection and recognition system for application in the context of Vessel Traffic Services (VTS) and Homeland Protection (HP) is proposed. The framework is designed to extend the functionality of traditional VTS systems by adding the visual dimension to the complex surface image. This allows to enhance the surveillance function in populated area where the public opinion is strongly concerned about electromagnetic emissions and therefore antennas are suspiciously observed and radars are not allowed.

The new software module (video processing unit) makes use of data coming from both electro-optical (EO) and infra-red (IR) cameras to detect (detection function) and track (visual tracking function) non-cooperative targets and to identify, by a classifier-based approach, boats and vessels.

In order to easily integrate the visual tracks in to existing systems, a validation module is foreseen to fuse information coming from the video processing unit and the VTS system. It aims at associating the visual tracks coming from the video analysis with the tracks provided by traditional VTS sensors making possible to provide the user with a new visual dimension in addition to the traditional geo-referenced VTS view. Case studies in populated areas such as Venice etc. will be presented.

10.4 Application of Satellite Remote Sensing Image in VTS

Author and presenter:

Mr Qi Xu, Maritime Safety Administration of P.R. China

Abstract:

Vessel Traffic Services (VTS) can contribute to the safety and facilitation of shipping and the prevention of marine pollution by ships, which have been widely used around the world, especially in high-density ship traffic ports, important routes, environmental sensitive sea areas, etc. Due to performance limitations of AIS, radar, CCTV facilities, it is difficult to gain accurate range of marine farms and sea ice, which are in a dynamic change. With unique advantages, remote sensing satellites can make up the deficiency of traditional surveillance equipment. By extracting data from satellite remote sensing images after image processing, we can get the information displayed in ECDIS system through three ways: first, direct plotting by manual; second, adding satellite remote sensing data to ENC database; third, overlay satellite remote sensing image on ENC image in ECDIS system by image fusion method. It will improve VTS efficiency.

10.5 New Sensors Like S-AIS can Enhance and Change the Role of VTS Beyond its Current Boundaries

Author and presenter:

Mr Jon Leon Ervik, Centre for Pilotage and Vessel Traffic Services, Norwegian Coastal Administration, Norway

Abstract:

Since 2010, Norwegian authorities have develop and operate AIS satellites in space.

The Norwegian Coastal Administration is responsible for coordinating the use of AIS information and ensuring that all relevant organizations have access to suitable data. AIS information from the satellite is integrated into the Norwegian Coastal Administration's shore-based AIS.

The information is shared with several national and international users, responsible for issues related to maritime safety, security and environmental issues. Based on the S-AIS information, we can already see some important benefits and opportunities for S-AIS as a VTS tool.

Accidents can occur far from the coast. In modern times, with almost global information, the focus on safety at sea starts beyond the territorial limits.

IMO has adopted five solutions and six areas of e-Navigation.

- Port areas and approaches
- Coastal waters and confined or restricted areas
- Open sea and open areas
- Areas with offshore and / or infrastructure developments
- Polar areas, and
- Other remote areas.

Results from the S-AIS indicate that a lot of information can be collected and distributed automatically.

The paper will present and discuss some issues related to new opportunities related to the use of S-AIS / AIS in right combination with the Vessel Traffic Management and Information System, VTS management, solution for sharing information with relevant authorities and integration with LRIT and e-Navigation.

The paper presents some examples and argumentation on the need and benefit for a VTS beyond territorial waters.

10.6 Discussion - Technical Session 7

VDES will drive new applications, is there a concern that VDES will be able to support user needs?

There are many communication systems available so VDES is just one, but we agree that the future may drive expansion.

It would be a major improvement if the new system can provide rudder and engine commands.

You could develop an algorithm that predicts, this can be improved with this type of data but it will come in time.

What kind of range and vessel size is supported by the camera?

In the case study they use a dome camera because it was close but surveillance cameras increase that range so it depends on the area being monitored. Infrared cameras are also being evaluated. The algorithm is agnostic to the range.

Comment: technical requirements should be evaluated to determine the type of optical sensor required. In some cases only military grade cameras have sufficient range and resolution.

11. TECHNICAL SESSION 8 – DECISION SUPPORT TOOLS IN VTS

Session Chair:

Mr Robert Townsend, Maritime Coastguard Agency, UK

11.1 Dynamic Risk Identification and Evaluation for Vessel Traffic

Author:s:

Mr Zheng Lufeng, Shenzhen Maritime Safety Administration, P.R. China *(left)*

Mr Huang Xi-gang, Shenzhen VTS center, P.R. China *(right)*

Presenter:

Mr Hailong Song

Abstract:

Since 2012, China Maritime Safety Administration has engaged academic institutions to collaboratively study the methodologies on risk identification and evaluation both for the specific vessel and the overall maritime traffic in a defined water area. The study utilizes fuzzy mathematical and statistical models, which acquire the traffic individual behaviour data, such as vessel geographical position, speed and course, through a VTS track data interface, to calculate the risk probability corresponding to each vessel with four classes of risks, such as collision, grounding, dragging and drifting. An information fusion algorithm is employed to derive the overall risk measurement for the marine traffic based on the above risk probability. Considering the constraint of practical computing capability, the study adopts an efficient learning methodology with neural network of artificial intelligence to predict the evolving risk of marine traffic simply based on the overall traffic statistic parameters, such as traffic volume, speed and density. With the derived risk probability and prediction, an expert system is designed to provide the risk control options (RCO) for the traffic organization in the VTS area.

11.2 Monitor Vessels' Abnormal Navigational Movement by VTS

Authors:

Mr Hailong Song, Yantai Maritime Safety Administration of P.R. China *(left)*

Mr Shaoming Yu, Yantai Maritime Safety Administration of P.R. China *(right)*

Presenter:

Mr Hailong Song, Yantai Maritime Safety Administration of P.R. China *(left)*

Abstract:

Over the years, people look forward to a more intelligent VTS system to help the operators to detect illegal or reduce accidents.

In this article, we try to refine some old theories about how to detect abnormal behaviours of vessels with new techniques in order to improve the accuracy of detection and resolve problems between theory and practice, and build a model that is more reliable and can be used to monitor ship's behaviours automatically.

The model can discover and identify ship's behaviour characteristics and their relationships by mass data processing technology which can analyse velocity, direction and other parameters under various conditions

and vessel types, then the model checks those new arrived ships' behaviours based on the rules found and alarm while unusual things are detected.

We have developed a test platform based on the improved theory, which can learn and optimize itself, and it revealed some interesting behaviour characteristics of vessels.

11.3 Decision Support Tools in VTS Based on Big Data

Author and presenter:

Mr Gyeungtae Nam, Global Control Systems (GCSC Ltd. Co.), Republic of Korea

Abstract:

To support VTS operator's decision making, we can use big-data technology effectively instead of traditional database. This study is about the development issues for Decision Support System (DSS) algorithm, traffic analysis and interface to VOC (VTS Operator Console) using maritime big-data. Tree tools based on maritime big-data with ENC display were presented:

Tool 1 – Decide on vessel safety level.

Tool 2 – Vessel traffic analysis. Use statistical data, accident information.

Tool 3 – Monitoring and warning

11.4 Vessel Height Measurement

Author and presenter:

Mr René Hogendoorn, SAAB Technologies, Sweden

Abstract:

With ever-increasing ship sizes, the question whether a particular ship is able to pass underneath an existing fixed bridge or not is becoming more and more common. An affirmative answer to this question may save passage time and may result in considerable fuel savings. On the other hand, damage to ship and bridge and the resulting disruption of operation may have even more severe economic consequences.

This presentation discusses vessel height measurement, in particular systems based on electro-optical sensors. With additional hydrological information, such a system provides sufficiently accurate measurements for use in a VTS Traffic Organization Service.

11.5 Dynamic Digital Decision Support

Author and presenter:

Mr Ómar Frits Eriksson, Chair IALA ENAV Committee

Abstract:

The availability of digital information on the whereabouts and other dynamic characteristics of vessels make it now possible to automatically discover abnormal behaviour of individual vessels through the use of advanced analytical algorithms. Utilizing data mining and big data techniques, black spots can automatically be identified, indicating where the risk is high and how it develops over time. The Danish Maritime Authority has already developed an Open Source software platform for discovery of abnormal behaviour and near-miss situations, which is available to IALA members. The notion of a Dynamic Risk index, which was introduced in the MARNIS project and later developed somewhat in the first EfficienSea project, should be developed further. The Dynamic Risk index is a near real time expression of the risk associated with each individual vessel at any given time, similar to an insurance fee in its nature. The sum of all vessel indexes in a given region is an expression of the aggregated risk within that region, at any given time. The presentation provided an overview of the abnormal behaviour and near-miss tool, and gave some thoughts on the further development and use of the Dynamic Risk index.

11.6 Discussion - Technical Session 8

Measurement of vessel height – safety margin – may be possible to deny passage for a vessel that could pass under a bridge?

Yes, this could happen. It depends on the level of margin incorporated. It is possible to choose a threshold to maximise transits, but also reduce the risk. This is something that has to be balanced. Other factors include weather conditions – current device is a prototype, however experience will enable refining of the tool.

12. TECHNICAL SESSION 9 – VTS COMMUNICATIONS

Session Chair:

Mrs Monica Sundklev, Swedish Transport Agency, Sweden

12.1 Tactical Communication Chart – The Visualisation of Voice and Data Communication

Author and presenter:

Mr Günter Dutzler, Frequentis AG, Austria

Abstract:

To fulfil the purpose of VTS, a VTS centre is using different systems for presenting the sensor and actor data as information to the operator such as communication (radio and telephony), vessel traffic image and port management information systems. A common trend is the integration of sensors and systems including intelligent and powerful data processing to provide information in terms of a common operational picture to the operator. A logical next step is the creation of the Tactical Communication Chart (TCC) which is the geographical way of communication and tracking.

Some examples of what kind of information can be presented:

- Voice communication: radio sites, radio coverage, radio calls, automatic radio selection
- Communication partner (e.g. ship): selected by processing data from radios, AIS, radar, radio direction finder. Based on this, additional information (e.g. from a central database) can be provided to the operator
- Relevant information: AIS and DSC messages, MSI, ship route, ETA
- Objects of interest: SAR stations, pilot stations, berths

This visualisation of communication and additional information is a way to support an operator in his decision making process by increasing the situational awareness and lowering the response time. The presentation of the Tactical Communication Chart shows the current customer implementation at a nationwide GMDSS and VTS system. Additionally, the presentation included a consideration of other possible implementations and information source candidates.

12.2 Practical Consideration in the Design and Development of a VTS Operators Language Training Course

Authors:

Mrs Seugee Choi and Mr Eunkyu Brian Jang, Korea Institute of Maritime and Fisheries Technologies, Republic of Korea

Presenter: Mrs Seugee Choi, Korea Institute of Maritime and Fisheries Technologies, Republic of Korea

Abstract:

As the importance of effective and clear communication has been significantly highlighted in order to ensure the safety of vessels at sea, the need for specialised English language training for those involved in maritime communication has also greatly increased. As key participants in maritime communication between ship and shore, in particular, VTS operators' (VTSO) English language competencies are of great importance for the successful fulfilment of their safety duties. For language trainers, this naturally leads to a question of what and how to train VTSOs, and to consideration of the design and development of specialized English language training specifically for those whose mother language is not English. In order to suggest practical considerations based on the theoretical background of English language training, the major concepts of English for Specific Purposes (ESP) and Business English as a Lingua Franca (BELF) will be first introduced. Subsequently, five key considerations for the design and development of a specialized language training course for VTSOs will be discussed. They include, namely, language transmitting techniques, the use of SMCP and plain language, cross-cultural VTS communication and the necessity for systematic language training. Finally, suggestions for the systematic development of a VTS language training system will be made.

12.3 Maritime Voice Communication Services on Converged Networks

Author:

Mr Andreas Reisenbauer, Frequentis AG, Austria *(left)*

Presenter:

Mr Günter Dutzler, Frequentis AG, Austria *(right)*

Abstract:

Convergence of networks driven by the network operators generates more impact on maritime voice communications solutions than obviously visible. Mainly efficiency driven more and more commercial network operators withdraw their services based on TDM infrastructure and consequently force their customers to switch to IP technology. Just replacing transmission technology without changing the way of using it would end up in decreased end to end service quality and even loose some of the services. Seizing the opportunity to move one big step forward by making use of IP network technology gives the chances for

- Flexible networks and network deployment, including
- Reduction of line costs at least in well developed areas
- Reduction of OPEX due to convergence between voice and data network operation

Along with all this excellence there are aspects which require special attention. Even if the validity of the motto "cubic capacity cannot be replaced, except with more capacity" is beyond any dispute, it is not only bandwidth that counts whether a network is "VoIP ready" or not.

Efficient use of IP bandwidth is crucial as the general statement of "IP bandwidth is more or less for free" fails if high value "Quality of Service" bandwidth matters. IP network as backbone does not only obviously give the chance to get rid of central switching components but also supports to waive most of the other central components and services. With this knowledge in mind we can deploy decentralised systems which are characterised through a high degree of scalability and high availability with limited failure propagation.

Robust system design implies analogue signal processing to be deployed at proper locations. Nevertheless, the main issue is caused by combination of variable delay along different paths combined with the maritime watch keeping service on e.g. channel 16. Inadequately designed services lead to reduced audio quality with significant reduced intelligibility causing worse end to end service level.

Migrating from TDM networks to VoIP technology (which is already well established in commercial telephone systems) provides the opportunity to reduce OPEX by both line cost reduction and increased flexibility in operations. When solutions comply with the principles described, the overall quality of

maritime voice services is as high or even higher compared to the ones being based on traditional networks.

12.4 VTS VHF Communications

Author and presenter:

Mr Thomas Southall, IHMA, Port of London, UK

Abstract:

Arguably VTS VHF communications is the primary focus of a VTS Operators profession. However, we see many examples in daily operations, training and marine accident investigations of bad practice and confusion around effective communication.

The transition of best practice from the classroom to the operations room can often be difficult. The majority of staff will have completed V-103/1 qualifications prior to recent years. This can then cause difficulty to the new entrant to go against the communications 'culture' established within a VTS authority. How can this be overcome in order to achieve consistency amongst operators?

What do we currently provide to operator's and what are the positives and negatives of this guidance? What improved material can we provide that will highlight the benefits of consistent standardised and structured VHF communications? What can IALA and VTS authorities do to make this information more user friendly and accessible?

12.5 Discussion - Technical Session 9

Can you provide an example of someone who speaks with a beneficial pace?

The former Secretary-General of IMO speaks 110 words per minute. In all excerpts he spoke at 110 words per minute.

Tactical Communication Chart (TCC) – seems to look cluttered – how does this work for the VTSO?

Concept of overload on the screen, yes this is taken into account – never to disrupt the operator. At present it is a concept of how it could look like – this would be an overview. There is a clear value for customers and the ability to have a TCC is being requested.

TCC – question on data security – with IP to transport voice packages, what measure are there for data security?

Data security is crucial. When the system is being built it is not a normal internet system, it is using an overlaying system that has additional security. There is a need to implement end to end systems to ensure security.

Would it not be better if in addition to including pilots in the VHF communications training provided to VTS operators, tug boat captains would also be included so that training embraces all the elements in a given traffic situation?

The speaker answered that it would indeed be best, where possible, if all those using VHF communications received training for doing so in a structured and consistent manner. He was of the firm belief that a more professional culture in the ops room had a positive influence on safety of navigation in the VTS area.

13. TECHNICAL SESSION 10 – EXCHANGE AND MANAGEMENT OF DATA AND INFORMATION

Session Chair:

Mr Ómar Frits Eriksson, Chair ENAV Committee

13.1 Increased problems and opportunities with AIS as is

Authors:

Mr Marcus Gustafsson, Saab TransponderTech, Sweden *(left)*

Mr Peter Bergljung , Saab TransponderTech, Sweden *(right)*

Presenter:

Mr Marcus Gustafsson, Saab TransponderTech, Sweden *(left)*

Abstract:

This paper presents some analysis responses of a few questions regarding AIS saturation and its future use which SAAB have received since last IALA-VTS where the situation in China was presented. The questions concerns:

- Is today's AIS working well?
- What are the limitations of AIS, (Class A, Class B (CSTDMA), Random access messages like static info (message 5)?
- What are the impacts and delays in saturated areas?
- What happens with AIS if unsolicited use of the VDL increases?

The paper presents the view of SAAB and our belief of what the system impacts will be and how the AIS community will have to cope with an increased usage of the VDL link for other purposes than identifying ships which was the initial use of AIS.

In summary, AIS is a robust system which will not break down in the near future when it comes to identify tracks. However many new applications with in VTS and Ship Traffic Management (STM) will require us to think about and prepare for the next step. Which means we are already in a transition phase from today's AIS to the future VDES.

13.2 VHF Data Exchange System (VDES) Revolutionizing Maritime Communications

Author and presenter:

Mrs Peggy Browning, ExactEarth, Canada

Abstract:

There are presently many challenges to VDES including technical challenges in installation as well as political in terms of regulation. One thing remains clear, the data would be invaluable to maritime authorities around the world.

Combining AIS information like ship type, speed and course over ground with VDES data around the health and maintenance records of the vessel to true, accurate weather analysis would provide for the safest most effective means to monitor the world's shipping.

Think of the benefits to port managers, route planners, ship operators and all those involved with the safety of navigation. One system would now be able to provide them with an accurate account of not only where a ship is currently but also if the ship is physically able to complete the trip and advise of potentially dangerous environmental factors it may face on its journey.

The presentation will cover:

- Current challenges facing VDES
- VDES and Satellite AIS- A winning combination for VTS

13.3 IVEF – Exchange and Management of Data and Information

Authors and presenters:

Mr Jeffrey van Gils, Netherlands Ministry of Infrastructure and the Environment *(left)*

Mr René Hogendoorn, SAAB Technologies, Sweden *(right)*

Presenter: Mr René Hogendoorn, SAAB Technologies, Sweden *(right)*

Abstract:

Vessel Traffic Services will play a major role in the future Sustainable Maritime Transportation System (SMTS). These services need accurate and reliable data to support the decision making process. Data is generally available for the area of responsibility but not necessarily for the entire area of interest. The latter area can be considerably larger than the area of responsibility and may include long-range harbour approaches and neighbouring areas (including Traffic Separation Schemes). Managing and, proactively, sharing data between shore and ship could give a VTS a head start in the SMTS.

A first step is to create a common traffic image by integrating data from ship and shore. This leads to a more complete coverage of the waterway and contributes to an enhanced maritime awareness. A first step to realize this - in a test bed environment, but already geared for day-to-day use - is sharing the data, collected by the sensors of the ship, with systems ashore and, after fusing this data, relaying the enhanced shore traffic image back to the ship.

13.4 What's Next for VTS?

Author and presenter:

Mrs Jillian Carson-Jackson, JCJ Consulting, Australia

Abstract:

The presentation highlighted changes in how we communicated, noting the surge in digital communications. While the focus of VTS is information - the collection, analysis and dissemination of information - how VTS interacts with information is changing. One key development is the VHF Data Exchange System (VDES). Looking at the capabilities of VDES, there is a need to ensure the user requirements are front and centre. The use cases for VDES were introduced, noting the need for supporting scenarios.

The presentation also introduced IALA's role in the development of VDES, and the link with the EfficienSea 2 project. IALA will be responsible for a number of tasks related to communications technologies. This includes developing a strategy for the introduction of different digital communications; a review of IALA documentation and documentation structure with regards to communications means; promoting

standardisation and sharing information within the IALA committees; IALA sister organisations and more generally within the maritime community on VDES and other communications technologies. In addition, IALA is now participating in the Maritime Cloud project, noting the link with other developments within IALA.

13.5 Discussion - Technical Session 10

Comment: User needs and technology does not seem to match very well together.

What to do about the real life situation? VTS people are still struggling.

VTSs very limited voice communication. If AIS based station out of service then it will be VDES unit providing more capabilities. Right that concerns: not yet carriage for VDES but for AIS. Need new standards. Will there be a transition period? Some will see the benefits over the costs. Technology has changed. It will not happen tomorrow but not in 50 years either. New generations will need more than voice communications to communicate with ships.

Difficult to realize what reality is. Need to realize that reality is coming very fast. Legislation can also be changed.

Maritime has always been behind aviation. Is it still the past or are we now ahead of them? Would a ship will to communicate with a plane?

We can be proud. AIS preceded aviation tools. With AIS already messages for SAR aircrafts. We are working with "them" on how to exchange data. Nothing has started yet except working between Organizations.

ICAO has been working on the same technologies for 30 years. Not implemented everywhere. We may have the opportunity to overtake aviation side. Only in 2015 aircraft could use technology similar to AIS.

Is there any carriage requirement for VDES?

Not at the moment. It was an opportunity with GMDSS in the beginning.

Comments:

France tries to change GMDSS for years. Real change would be radio communications. Many steps forward to the modernization taking e-navigation into account.

It is surprizing that there can be modernization without carriage requirements. There will be opposition at IMO from various sides, e.g. ship owners. The shipping industry needs digital information for business. What has to be there? Digital or analogue communication? Try to make a global maritime safety distress system. But nobody wants it globally managed. A solution is needed there. There is a need to secure communications. An IMO instrument exists to secure communications. It can start with digital tools for search and rescue and the rest will follow.

If VDES starts with VTS maybe it will happen anyway.

14. TECHNICAL SESSION 11 – VTS BEST PRACTICES

Session Chair:

Dato' Rossid Bin Musa, Deputy Director General of Marine, Malaysia

14.1 Seamless Data Access Reduces Workload on VTS Internal Procedures

Authors:

Mr Dirk Eckhoff *(left)* and Mr Christian Herrlich *(right)*, Federal Waterways and Shipping Administration, Germany

Presenter: Mr Dirk Eckhoff, Federal Waterways and Shipping Administration, Germany

Abstract:

Today the VTS operators are supported by many technical means. Displays show data provided from VTS own sensors and external sources. Before being presented the traffic data may be processed and integrated into *one* traffic image. Additional information from the external sources is often kept separately without integration.

But how to extract the integrated data to reuse it in electronic communication with vessels or the users ashore?

How to retrieve data from the not integrated sources and merge it into reports and messages?

How to distribute the information to numerous recipients with minimum delay and operator´s distraction?

How to perform the VTS-operation and incident management and at the same time keep record of the internal activities plus the current traffic situation for later investigations?

The German Waterways and Shipping Administration implemented applications that give answers to the questions above. The applications reduce the operator's workload significantly by the provision of automated and interactive functions and seamless data transfer between applications.

The quality of VTS increases because the operator can concentrate on his primary task "Vessel Traffic Services" while the technical servers do what they are built for: serve the user by overtaking the time consuming internal procedures.

14.2 The Challenge to Improve VTS Operation in Japan

Author:

Mr Shinya Suzuki, Navigation Safety Division, Maritime Traffic Department, Japan Coast Guard

Presenter:

Eiichi Masuda, Japan Coast Guard

Abstract:

For the safety of navigation at the congested sea area in Japan, the Japan Coast Guard considers the improvement of VTS operation regularly.

In this presentation, the Japan Coast Guard introduces the new challenge to improve VTS operation as follows:

1. The integrated operation of VTS centre and port control offices

In Tokyo bay, the Japan Coast Guard operates Tokyo wan VTS centre and 4 port control offices, however, they are operated independently now. To minimize the damage caused by the disaster and realize the efficient traffic from outside of Tokyo bay to inside of ports, the Japan Coast Guard plans to integrate VTS centre and 4 port control offices.

The Japan Coast Guard explains the outline of the integrated operation of VTS centre and port control offices in Tokyo bay.

2. VTS operator training

The Japan Coast Guard trains VTS operators based on IALA V-103. The Japan Coast Guard explains the detail of the training and new challenge for the efficient training.

14.3 So How Good Are We?

Author and presenter:

Mr Kevin Gregory, IHMA, Port of London, UK

Abstract:

As the VTS sector has developed and the range of supporting technologies has increased, the mission of VTS has evolved to take account of new practices and concepts.

Some of the new practices and concepts have been related to safety whereas there is also an increasing focus and drive to improve commercial efficiency.

In keeping pace with these wide ranging regulatory, operational and commercial developments, VTS Authorities have had to develop rapidly in a changing and cost sensitive environment.

This presentation will review how VTS Authorities can demonstrate their operational and cost effectiveness in a maritime sector where competition is significant.

How can VTS Authorities demonstrate their operational effectiveness? Accidents and incidents are generally well publicised – for every one of these there must be hundreds of successful preventative actions.

How can VTS Authorities demonstrate their cost effectiveness? How can the Financial Director be assured that VTS needs that radar, that communication equipment – how can the 'profit' of a VTS be quantified?

How can VTS Authorities strike the right balance between the safety of navigation and commercial efficiency?

14.4 Traffic Organisation on the River Scheldt

Author and presenter:

Els Bogaert, Shipping Assistance Division, Belgium

Abstract:

A more intense traffic management of the approach to the port of Antwerp is essential to ensure safe and efficient shipping on this maritime access route.

Challenges, due to:

- the river Scheldt is a difficult river to sail on
- the increase in vessels dimensions bound for the port of Antwerp

- the recent developments around the tidal Deurganckdok
- the new Kieldrechtlock went into service in July 2016 (biggest worldwide)

Because of these above mentioned facts, it is no longer possible to rely on the self-regulating traffic. A central traffic regulation service imposes itself.

A better organisation of the traffic will contribute to optimize the capacity of the fairway in a safe and efficient way.

14.5 Enhancing the Competency of Singapore VTS Personnel for Greater Performance

Author and presenter:

Capt Henry Heng Fok Yong, MPA, Singapore

Abstract:

Singapore VTS is at the forefront of VTS operations, providing services to one of the world's busiest port and the Singapore Strait.

The presentation will give an introduction on Singapore VTS, touching on the history, operations and best practices. Singapore VTS recognizes that challenges are dynamic and can be mitigated by the introduction of measures, with enhancement over time, could be developed into best practices.

One of the best practices is the development of a Competency and Training Framework for VTS personnel. This helps to translate an organization's strategic priorities into clear expectations for employees.

Singapore VTS also hosts numerous visits for the shipping community to the Port Operations Control Centre. It allows opportunity for the visitors to learn more on VTS and gives insight to the services and challenges faced by VTS personnel.

14.6 Discussion – Technical Session 11

Referring to the movie the other day where two vessels were approaching a place where it is prohibited to meet – how would the TOS work in this case?

Initial step is to have the cooperation of the seafarer (advice) but can move to instruction if required (as per TOS)

Do not hire master mariners – has this ever been a problem that the pilot does not respect the VTS operator?

Yes, sometimes there are problems – the pilot ears the VTS operator but the pilot thinks he knows best. Over the years, however, there is a change in mentality.

What is retention rate? What is the key element that you think is required for retention?

There is a need to keep persons, to have a good retention rate. Since 2012, in the last three years two persons have changed (move to day work) so they tried to provide opportunity in other departments.

All staff is given 15 days of soft skill training per year.

The use of employee feedback survey assists in ensuring the personnel are included in the development of the programme. There are also incentives such as an award programme, which recognises the employee.

15. TECHNICAL VISIT TO THE VTS CENTRE OF PORT KLANG

Well over 150 delegates eagerly took the opportunity to visit the VTS centre at Port Klang. From its location in the West Port Tower, the VTS operations room offers stunning views onto and beyond the islands forming a natural barrier between the port's North and South approach channels and the Strait of Malacca.

Port Klang is located on the west coast of Malaysia and has developed into a major gateway for both regional and international seatrade due to its strategic location along the Malacca Strait. The port is a declared compulsory pilotage district and has a water depth ranging from a minimum of 15 metres to 18.5 metres, adding to its commercial attraction and making it accessible for the new generation of mega box ships. The CMA-CGM operated, 16,020 TEU *Marco Polo*, the largest container ship in the world (by TEU capacity) when she was launched in November 2012, discharged a load of 14,398 twenty equivalent unit containers at Port Klang on her historic maiden voyage.

Equipped as both a radar station and AIS base station, the VTS centre has two further radar sites – at Pulau Angsa (Kelang) and Bukit Jugra (Banting). It also can receive radar information from the One Fathom Bank remote sensor site.

The VTS centre was first commissioned in 1997 and underwent a comprehensive upgrade by Signalis SA earlier this year, at a total cost of just under Malaysian Ringgit (MR) 4.3 million (approximately 1M Euros). Among key features are CCTV, ECDIS with radar and AIS overlays, VHF for continuous radio contact with targets, and automated continuous data recording for incident and casualty investigation and for training purposes.

Welcoming delegates, Port Klang's Marine Manager, Captain Kamal Ariffin Bin Idris, said that the availability of the enhanced vessel traffic information and monitoring service offered added value in terms of both safety of navigation and protection of the environment. The VTS centre also played an important role in security surveillance of the Malacca Strait.

16. IALA ACTIVITIES AND INTERNATIONAL COOPERATION

Session Chair:

Captain Tuncay Çehreli, DGCS Turkey, Chair VTS Committee

16.1 World Wide Academy

Author and presenter:

RAdm Jean-Charles Leclair, Dean WWA

Abstract:

R. Adm. Jean-Charles Leclair presented the IALA World-Wide Academy and summarized its activity since its creation in 2012. The Academy is the vehicle by which IALA delivers training and capacity building to national authorities. It is an integral, but independently funded, part of IALA. During the four years and a half of activity, the IALA WWA organised 20 Awareness seminars for AtoN and/or for VTS Authorities all over the world (100 participating countries), 16 need assessment missions, 7 high-level visits, 3 four-week level 1 AtoN Manager courses at IALA Headquarters plus the participation to 6 courses organized by China, France and Spain, 4 one-week training seminar on risk management and 13 missions to assist countries to organize AtoN and VTS training. He insisted on the fact that all that activity is the result of the efforts produced not only by the IALA personnel but also by all the IALA family and thanks to the sponsors. He concluded by thanking everyone for their superb support.

16.2 VTS – ENAV Joint Working Group

Authors and presenters:

Captain Tuncay Çehreli, DGCS Turkey, Chair VTS Committee

Mr Ómar Frits Eriksson, Chair ENAV Committee

Abstract:

Mr Ómar Frits Eriksson appointed that the coordination between the VTS and the ENAV Committees is important. VTS will function as the front office of ENAV. ENAV is nothing without delivery of services. VTS delivers advanced services.

To facilitate coordinate IALA set up the Joint WG VTS-ENAV. To ensure timely interaction/communication, coordinate/integrate work programme, ensure common understanding of tasks, facilitate the exchange of views and opinions across the Committees. The Joint WG consists of Chairs and Vice-Chairs of both Committees, chaired by DSG but it is open to all VTS and ENAV Committee participants.

But maybe there will be a need to do more when revisiting the IALA work programme and Committee structure for the next period.

Captain Tuncay Çehreli informed that the main aim of this meeting was, of course, to bring VTS and ENAV experts together and provide them a platform to discuss on a particular matter “digital interaction between ship and VTS” and some other VTS and e-navigation related matters.

The objectives of this first meeting were;

- To define digital interaction and communication between ship and VTS,
- To discuss on advantages of digital communication in terms of interaction,
- Identify type and level of VTS-ship digital communications and interaction (text, symbol, picture - information, advice, instruction)

After very productive and constructive open discussions, the meeting concluded by a number of conclusions

16.3 The Future of VTS Seen from the Ship

Author and presenter:

Johan Gahnström, INTERTANKO

Abstract:

In his presentation, INTERTANKO's Johan Gahnstrom focused on the need for a more standardised approach by shore services to vessels. He discussed training and the possibility of having VTS officers' training as a part of STCW to have consistency with the officers they communicate with on the bridge. He also touched on the current situation where many port information services around the world exist and often act as VTS but without the training, knowledge, and sometimes equipment, that properly organised VTS centres can boast. Consistency in services to vessels is very important.

16.4 The Nautical Institute

Author and presenter:

John Lloyd, Nautical Institute

Abstract:

The Nautical Institute is the representative body for maritime professionals over 7000 members in 115 countries. The Institute is keen to consider work done by IALA and participate in it regularly. The Nautical Institute gives feedback from mariners. Some IALA VTS Committee participants are also members of the Nautical Institute.

The Institute is also involved in accreditation of training institutes.

16.5 The Role of Today's International Harbour Masters in Port Operations and their Key Role in Safety of Navigation

Author and presenter:

Kevin Richardson, IHMA

Abstract:

At the forefront of IHMA's objectives is the maintenance of Safety of Navigation in ports and in port approaches and the improvement of safety standards through shared knowledge and expertise. The presentation will show how the role of a harbour master is central in the monitoring and control of safety of navigation in ports and how it interacts with the Pilot, Master and VTS Operator in planning and delivering safe operations in ports.

16.6 Remark from the INTERTANKO and IHMA Presentations

From the presentations of INTERTANKO and IHMA the following remark was made:

There is a need for greater clarity and consistency in the delivery of VTS throughout the world, particularly the services provided, communications, qualifications and training, as highlighted by INTERTANKO and IHMA, and a framework for international certification could be considered.

16.7 Presentation from the Republic of Korea on the 19th IALA Conference Incheon

Mr Younf-so Kim, Director, Aids to Navigation Division, Ministry of Oceans and Fisheries gave a presentation on the hosting of the 19th IALA Conference between 27 May and 2 June 2018 at the Songdo Convensia, located in the Songdo International Business District of Incheon, Republic of Korea.

He summarized three statements:

- Successful voyages, sustainable planet
- World festival for all
- A meaningful legacy for the future.

The first statement, the motto of IALA, can be achieved by the Conference itself.

There will be two sessions of the IALA Council. There are also two sessions of the General Assembly planned.

A companion programme will be arranged for sightseeing and shopping.

The second statement can be achieved by various exhibitions during the Conference.

The Industrial Expo will show the newest technologies related to Aids to Navigation.

There will also be a heritage exhibition of cultural and historical lighthouses from all over the world.

The third statement reflects to the Incheon Declaration which is planned to set out a new vision for the preservation of historic lighthouses as world heritage.

The intention is to convene the 2nd Asia-Pacific e-Navigation Underway conference back to back with the IALA Conference.

16.8 Presentation from the Netherlands on 14th VTS Symposium Rotterdam

Mr Pieter Paap, Ministry of Infrastructure and the Environment, the Netherlands introduced the Netherlands as host of the next IALA Symposium in 2020. This will not only be a VTS Symposium but a combined VTS and e-Navigation Symposium due to developments.

He then presented a video to introduce the country and its facilities.

17. SYMPOSIUM CONCLUSIONS

Chair: Captain Tuncay Çehreli, DGCS Turkey, Chair VTS Committee

17.1 Symposium VTS2016 Conclusions

Captain Tuncay Çehreli, Chair of the VTS Committee, ran through the Conclusions derived from the Symposium proceedings. A hard copy was available for each delegate.

The final conclusions drawn after minor amendments during the presentation were:

1.	*There is a need for guidance on how to develop a safety culture in VTS.*
2.	*There is a compelling need to amend IMO Resolution A.857(20) Guidelines for Vessel Traffic Services to ensure the Resolution continues to provide an effective instrument providing a clear and concise global framework for both Contracting Governments and mariners.*
3.	*Interaction and communication is not unique to VTS and inspiration from other sectors, such as the aviation sector, may facilitate the development of enhanced and harmonised guidance on communications and phraseology.*
4.	*Training for VTS personnel needs to reflect the experience and actual environment of the VTS centres and take into account the educational and cultural background of the candidates.*
5.	*Cooperation between countries for VTS Training, such as the one organised between the ASEAN countries, is a significant step forward in ensuring effective and harmonised implementation of VTS.*
6.	*New sensors and communication systems, such as VDES, facilitate increased interaction between VTS and vessels even beyond VTS areas and there is need for leadership on utilising the opportunities these new technologies will provide.*
7.	*There is a need to enhance Decision Support Tools to take advantage of emerging concepts and technologies.*
8.	*VTS provides a focal point for e-Navigation and there is a need to ensure ongoing coordination between VTS and e-Navigation.*
9.	*The emergence of big data and the concept of dynamic risk indices present an opportunity to establish a harmonised risk factor to assist the VTS to monitor and respond to abnormal behaviour of vessels.*
10.	*The legislative relationship between VTS and AtoN needs to be considered in the light of international conventions.*
11.	*There is a need to develop criteria to assist Authorities to ensure that the VTS operational objectives are being met.*

17.2

17.3 Thanks from IALA

IALA Secretary-General Francis Zachariae conveyed all good wishes from the IALA President, Mr Juan Francisco Rebollo, who unfortunately had been unable to travel to Kuala Lumpur due to other pressing duties.

He expressed warmest thanks to the many people who had ensured that the Symposium had been not only very successful but also a most memorable one. He had no doubt it would go down in IALA's history. It had been exceptionally well organized and executed in all respects. This had been thanks to the outstanding leadership and commitment of Mr Baharin and Captain Halim and the tremendous efforts of the staff at Malaysia's Marine Department, which had been a most gracious as well as most effective host, with the full support of the Minister of Transport, the enthusiastic engagement of the local maritime community, and the generous financial assistance from Malaysia's Light Dues Board. The whole week had been all the more enjoyable thanks to the wonderful hospitality and the constant attention and assistance from so many hard-working yet always smiling staff, who had made sure everything ran smoothly down to the smallest detail.

He also thanked the speakers for the impressive consistency in the quality of all their presentations, and the sessions' chairs for their effective time management and creative running of the sessions. Special thanks were also due to the exhibitors and IALA's Industrial Members for the multi-faceted products they had brought to Kuala Lumpur for display. The exhibition had demonstrated that the industry was well ahead in e-navigation and was leading innovation, and this was good news and would guide IALA in its work.

He further thanked most sincerely the support staff from the IALA Secretariat and also the chair and vice-chair of the IALA VTS Committee, Captain Tuncay Cehreli and Mr Neil Trainor, for their support and guidance.

Last but not least, he praised delegates for their keen participation, as reflected in the good and difficult questions and the ensuing discussions that had made the Symposium so valuable. The atmosphere had been friendly, technical and constructive throughout, and this was what "the IALA family" was all about. He looked forward to seeing everybody again at the 2020 VTS Symposium in Rotterdam.

In concluding his thanks, he drew attention to the imminent retirement of the Dean of the IALA World-Wide Academy, Rear Admiral Jean-Charles Leclair, who would retire on 31 August, with the Dean Designate, Mr Omar Frits Eriksson, taking over on 1 September. In thanking him most sincerely for all he had done for IALA over the past 20 years, and for his successful leadership of the WWA , he said he would be very much missed and wished him all the very best for his retirement.

The full text of Mr Francis Zachariae's closing speech is at ANNEX F.

17.4 Closing of the Symposium

Dato' Baharin Bin, Director General of the Marine Department of Malaysia

Mr Baharin was generous in his thanks to IALA for bringing the 13th International Symposium on Vessel Traffic Services to Kuala Lumpur and to the sponsors and also thanked wholeheartedly all international and local speakers, who had made sure the week had been a hectic one, with 11 sessions on VTS operations in ports and waterways, and on VTS and e-navigation, all with the emphasis on sustainable safe navigation. The whole Symposium had been marked by extremely fruitful and productive discussions, active exchanges of opinions and ideas, and lively debates relating to the provision, operation, maintenance and use of VTS.

Malaysia had become a member of IALA in 1962 – that was almost as long as IALA had existed – and an active member of its Council since 2002. As further demonstration of Malaysia's commitment, he announced that the Light Dues Board of Peninsular Malaysia would implement new measures in three major areas of maritime safety. These concerned remote monitoring for all aids to navigation in Malaysia, the construction of a new VTS centre at Port Klang to centralize monitoring of all VTS operations in Malaysia, whether port or coastal VTS, and the acquisition of a new buoy tender vessel that would also serve training purposes.

With that he officially declared the 13th International VTS Symposium closed.

The full text of the closing speech of the Director General of the Marine Department Malaysia is at ANNEX G.

18. EXHIBITION & SPONSORSHIP

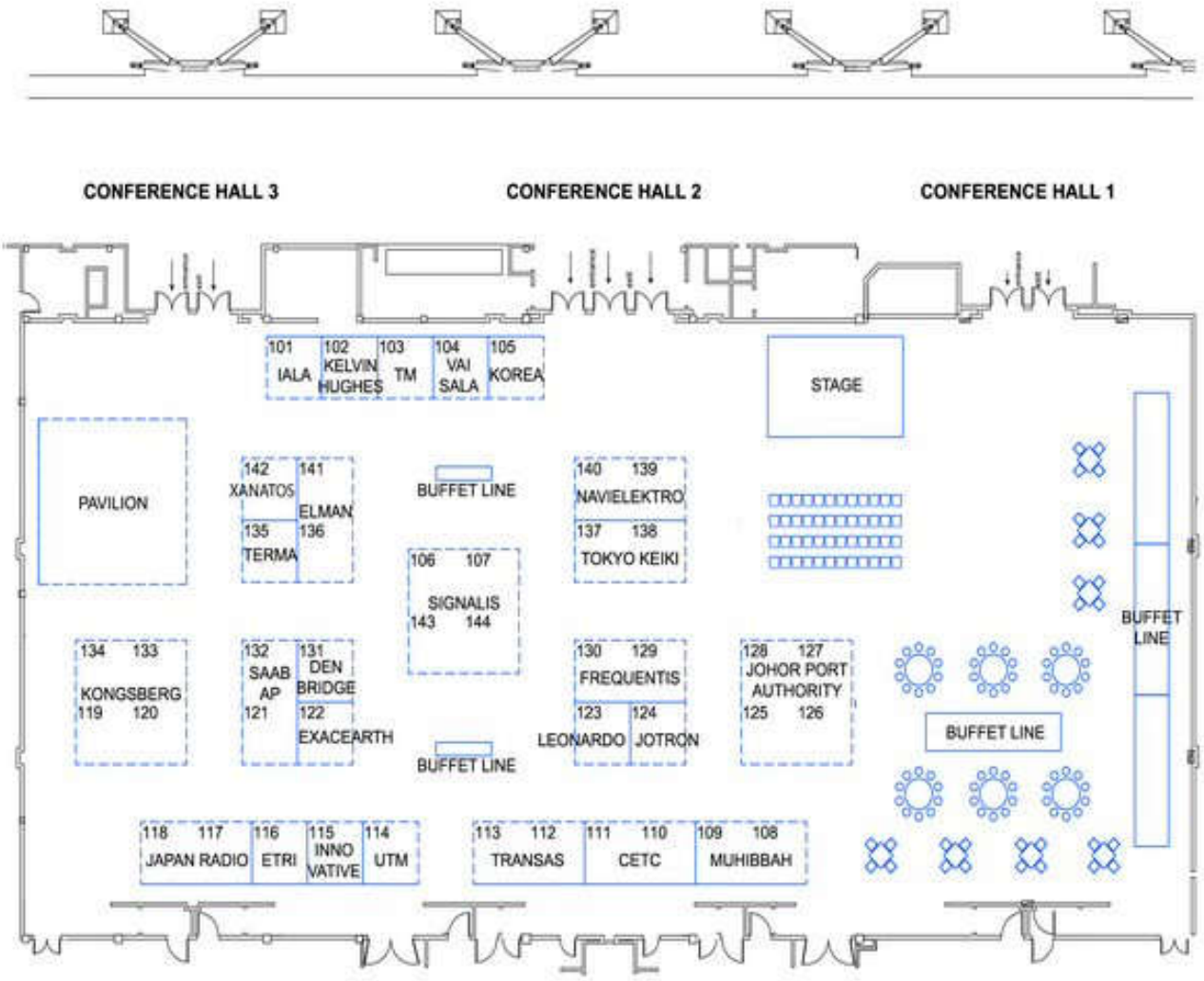
The Exhibition was opened during the Opening Session at the entrance of the Exhibition Hall by Datuk Ab. Aziz Kaprawi assisted by Mr Kitack Lim, Dato' Baharin Bin Dato' Abdul Hamid, Mr Francis Zachariae and Mr Mohamad Halim Bin Ahmed.

18.1 Exhibitors

Booth number	Name of exhibitor
101	IALA
102	Kelvin Hughes *
103	VTS Technical Support
105	Ministry of Oceans and Fisheries Korea
106, 107, 143, 144	Signalis *
108, 109	Muhibbah Marine Engineering
110, 111	CETC International Co Ltd
112, 113	Transas Marine Limited *
114	University Technology Malaysia
115	Innovative Navigation
116	ETRI *
117, 118	Japan Radio Co Ltd *
119, 120, 133, 134	Kongsberg Norcontrol IT AS*
121, 132	SAAB AB *
122	ExactEarth Ltd *
123	Leonardo
124	Jotron AS *
125, 126, 127, 128	Johor Port Authority
129, 130	Frequentis AG *
131	DenBridge Marine Ltd *
135	Terma A/S *
136, 141	Elman SRL*
137, 138	Tokyo Keiki Inc *
139, 140	Navielektro *
142	Seafarer Management Centre Malaysia

* Indicates an IALA Industrial Member

18.2 Exhibition Floor Plan



Layout of the exhibition hall

Besides the registered Symposium participants there were also 84 external visitors to the exhibition.

During the exhibition 418 Malaysian students and 22 teachers from 11 schools visited the exhibition and were informed via presentations on the stage of the exhibition hall.

19. SOCIAL EVENTS

19.1 Welcome dinner

On 8 August a welcome dinner was held at the Royal Chulan Hotel.

19.2 Official Symposium Dinner

On 11 August the Official Symposium Dinner was held at the Grand Hyatt Hotel. Again traditional dances were performed.

20. PARTNER PROGRAMME

During the Symposium day-excursions were offered to Malacca and Kuala Lumpur where several attractions could be visit. It was participated by 22 international and 13 local guests.

21. ACKNOWLEDGMENTS

The Symposium expressed its appreciation to the Marine Department of Malaysia and in particular Captain Mohamad Halim Bin Ahmed and his staff for the enormous support to make the 13th VTS Symposium a success.

It wished to acknowledge the following strategic partners:

	Sponsors
Platinum	Signalis
Gold	Port Klang Authority
Bronze	Bintulu Port Authority
	Terma A/S
	Tokyo Keiki Inc
	Green Finder
	Muhibbah Marine Engineering
	Johor Port Authority
	Support TM
	Kuantan Port Consortium
	AMC Search

The Symposium acknowledged also the Kuala Lumpur Convention Centre without which it would not have been possible.

The reporting of the technical sessions and the compilation of the report was undertaken by:

Mrs Jillian Carson-Jackson

Mrs Marie-Hélène Grillet

Mrs Peggy Browning

Mrs Aline De Bièvre

Mr Wim van der Heijden

Thanks were also extended to those contributed to the drafting of the Conclusions.

ANNEX A LIST OF DELEGATES

	Name	Last Name	Company	Email
AUSTRALIA				
	MR.NEIL	TRAINOR	AUSTRALIAN MARITIME SAFETY AUTHORITY	neil.trainor@amsa.gov.au
	MR.SIMON	BROOKS	AUSTRALIAN MARITIME SYSTEM	marketing@marsys.com.au
	MR.JAMES PAUL	HAGAN	AUSTRALIAN MARITIME SYSTEM	jamie.hagan@marsys.com.au
	MR.SHANNON	HOBBS	AUSTRALIAN MARITIME SYSTEM	marketing@marsys.com.au
	MR.DANIEL	FROST	MARITIME SAFETY QUEENSLAND	daniel.g.frost@msq.qld.gov.au
	DR.TERRY	O'BRIEN	OMC INTERNATIONAL	t.obrien@omcinternational.com
	MR.STEPHEN	D'SOUZA	PORT OF MELBOURNE CORPORATION	stephen.dsouza@portofmelborne.com
	MR.MATT	BEST	UNI.OF TASMANIA - AMC SEARCH	m.best@utas.edu.au
	CAPT.DILIP	ABRAHAM	Victorian Regional Channels Authority	dabraham@regionalchannels.vic.gov.au
AUSTRIA				
	MR.GUENTER	DUTZLER	FREQUENTIS AG	guenter.dutzler@frequentis.com
	MR.FLORIAN	GRUBER	FREQUENTIS AG	florian.gruber@frequentis.com
	MR.CLAUS	KRUMMREY	FREQUENTIS AG	ck@uol.com.hk
	DR.ALEXANDER	NEUHAUS	FREQUENTIS AG	alexander.neuhaus@frequentis.com
BAHRAIN				
	MR.MAZEN	AL-BALOOSHI	MINISTRY OF TRANSPORTATION &TELECOMM	mazen.albalooshi@mot.gov.bh
BELGIUM				
	MS.ELS	BOGAERT	SHIPPING & ASSISTANCE DIVISION	els.bogaert@mow.vlaanderen.be
CAMBODIA				
	MR.SOK	CHHANNARA	PHNOM PENH AUTONOMOUS PORT	sokchanara54@gmail.com
	MR.TOL	SOKHOM	PHNOM PENH AUTONOMOUS PORT	tolsokhom@yahoo.com
CANADA				
	MR.BRUCE	WINTER	EXACTEARTH	bruce.winter@exactearth.com
	CPT. BRIAN	TUOMI	NAUTICAL CONSULTING International Ltd	briantuomi@nauticalconsulting.com
	MR.FRASER	EDISON	RUTTER INC	fedison@rutter,ca
	MR.STEPHEN	HALE	RUTTER INC	shale@rutter.ca
CHILE				
	COMMANDER JAMES	CRAWFORD	CHILEAN NAVY - DIRECTEMAR	jcrawford@dgtm.cl
	COMMANDER ITALO	SOLARI	CHILEAN NAVY - DIRECTEMAR	italosolari@gmail.com
CHINA Rep of				
	LI	WENHUA	CHINA MARITIME SAFETY ADMINISTRATION (MSA)	liwenhua1031@163.com
	MR.BENJAMIN	WONG	INVEST HK,HK GOVERNMENT	bwong@investhk.gov.hk
	ZHIWEI	FAN	MARITIME SAFETY ADMINISTRATION OF PR	fanzhiwei@nbmsa.gov.cn

	Name	Last Name	Company	Email
	MR.HAILONG	SONG	YANTAI MARITIME SAFETY ADMINISTRATION	callieo@126.com
CHINA Hong Kong				
	MR.CHI TUNG	LAI	MARINE DEPARTMENT HKSAR	ctlai@mardep.gov.hk
	MR.YIU TIN	POON	MARINE DEPARTMENT HKSAR	ytpoon@mardep.gov.hk
	MR.SHAYNE	GENT	POLE STAR GLOBAL	shayne.gent@polestarglobal.com
	MR.BEN	MINICHINO	POLE STAR GLOBAL	ben.minichino@polestarglobal.com
DENMARK				
	MR.NIELS JACOB	MYGIND	DEFENSE COMMAND DENMARK	njmyg@mil.dk
	CPT.PER BAEK	HANSEN	HANNE BURKAL	pbh@mil.dk
	CPT.JORGEN	BRANDT	NAVYBASE KORSOR	SOE-VTSS100@MIL.DK
	MR.JENS CHRISTIAN	PEDERSEN	TERMA A/S	jcp@terma.com
ESTONIA				
	MR.HENDRIK	HEINASTE	ESTONIAN MARITIME ADMINISTARTION	hendrik.heinaste@mail.ee
FIJI				
	MR.PHILIP	HIL	IALA	philip@msaf.com.fj
FINLAND				
	MR.MATTI	ERONEN	FINNISH TRANSPORT AGENCY	matti.eronen@fta.fi
FRANCE				
	CAPT..JEAN-CHARLES	CORNILLOU	CEREMA	jean-charles.cornillou@cerema.fr
	MR.MAHDI	AL-MOHSAWI	IALA	mahdi@iala-aism.org
	MR.KNUD	BENEDICT	IALA	
	MRS.VIRGINIA	BUTLER	IALA	virginia.butler@iala-aism.org
	MS.ALINE	DE BIEVRE	IALA	aline@debievre.co.uk
	MS.GERARDINE	DELANOYE	IALA	gerardine.delanoye@iala-aism.org
	MR.OMAR FRITS	ERIKSSON	IALA	omar.eriksson@iala-aism.org
	MS.Marie-Hélène	GRILLET	IALA	marie-helene.grillet@iala-aism.org
	MRS.JILIAN CARSON-	JACKSON	IALA	jcj@iinet.net.au
	MR.JEAN-CHARLES	LECLAIR	IALA	
	MR.KINJI	TAKEUCHI	IALA	
	MR.WIM	VAN DER HEIJDEN	IALA	wim.vdh@iala-aism.org
	MR.FRANCIS	ZACHARIAE	IALA	francis.zachariae@iala-aism.org
	MR.XAVIER	LEFEVRE	SIGNALIS	xavier.lefevre@signalis.com
GERMANY				
	MR.STEFAN	BOBER	WATERWAYS & SHIPPING ADMINISTRATION	Stefan.Bober@wsv.bund.de
	MR.DIRK	ECKHOFF	WATERWAYS & SHIPPING ADMINISTRATION	dirk.eckhoff@wsv.bund.de
	MR.GERHARD	MÜLLER-HAGEN	WATERWAYS & SHIPPING ADMINISTRATION	gerhard.mueller-hagen@wsv.de
	MR.RAINER	STRENGE	WATERWAYS & SHIPPING ADMINISTRATION	rainer.strenge@wsv.bund.de

	Name	Last Name	Company	Email
	MR.ALFRED	KOTOUCZEK	WEATHERDOCK AG	akotouczek@weatherdock.de
INDIA				
	MR.JINOFER	BHUJWALA	AATASH NORCONTROL LTD	jino@aatash.com
	MR.JASWANT SINGH	CHAUHAN	DIRECTORATE GENERAL OF LIGHTHOUSE	jschauhan1958@gmail.com
	MR.ELLAPPAN	MURTHY	DIRECTORATE GENERAL OF LIGHTHOUSE	emurthy@gmail.com
	MR. KANWAR PAL	SINGH	DIRECTORATE GENERAL OF LIGHTHOUSE	kpsingh02jan@gmail.com
	MR.DEEPAK KUMAR	SINHA	DIRECTORATE GENERAL OF LIGHTHOUSE	dksinha01234@gmail.com
	MR.BARUN	MITRA	MINISTRY OF SHIPPING	barunmitra@gov.in
	MR.SAURABH	VARMA	RECKTRONIC DEVICES&SYSTEM (RDS)	saurabh.varma@rds.co.in
INDONESIA				
	DR.MAIN JOLY	SITEPU	AMSAT INTERNATIONAL	sitepu.mj2@gmail.com
	MR.FATHAN	MUTA'ALI	DIRECTORATE GENERAL OF SEA TRANSPORTION	fathan.mutaali@gmail.com
	MR.NANDITYA	WARDHANA	DIRECTORATE GENERAL OF SEA TRANSPORTION	nanditya.wardhana@ymail.com
	MR.I MADE	DARSANA	DISTRICT NAVIGATION CLASS II BENOA	benoavts@gmail.com
	MR.MUHAMMAD	IQBAL	INDONESIA PORT CORPORATION	muhammad.iqbal@indonesiaport.co.id
	MRS.MERRY	OKTARINA	INDONESIA PORT CORPORATION	merry.oktarina@indonesiaport.co.id
	MR.PRASETYADI		INDONESIA PORT CORPORATION	
	MR.MEDI	KUSMANA	IPC MARINE SERVICE	medi.kusmana@ipcmarineservice.co.id
	MR.SUPARDI	MASDUKI	IPC MARINE SERVICE	supardi@ipcmarineservice.co.id
	MR.SHINYA	SUZUKI	JAPAN COAST GUARD	cocoapan1982@yahoo.co.jp
	MR.GAGAH SATRIO	WIBOWO	PT MULTIINTEGRA	
	MR.TRIYANA		PT MULTIINTEGRA	triyana@multiintegra.co.id
IRELAND				
	MR.DMITRY	ROSTOPSHIN	TRANSAS	Dmitry.Rostopshin@transas.com
ITALY				
	MR.ENRICO	FIORE	D'Appolonia S.p.A	enrico.fiore@dappolonia.it
	MR.CESARE	GIULIANI	GEM ELETTRONICA	giuliani@gemrad.com
	LT.MICHELE	LANDI	ITALIAN COAST GUARD	michele.landi@mit.gov.it
	MS.BARBARA	MAGRO	ITALIAN COAST GUARD	barbara.magro@mit.gov.it
	REAR ADMIRAL PIERO	PELLIZZARI	ITALIAN COAST GUARD - Headquarters	piero.pellizzari@mit.gov.it
	MS.SIMONETTA	DI DIMENICO	LEONARDO	simonetta.didomenico@leonardocompany.com
	MR.MICHELE	FIORINI	LEONARDO	michele.fiorini@leonardocompany.com
IVORY COAST				
	MR.DJEDJE L. J.	MARC	PORT AUTONOME D'ABIDJAN	djedjemarc@gmail.com
	MR.SORO	SINALY	PORT AUTONOME D'ABIDJAN	sinaly.soro@paa.ci

	Name	Last Name	Company	Email
JAPAN				
	MR.SETSUO	AKAISHI	JANA	aakaishi@jana.or.jp
	MR.HIDEKI	KIMIDUKA	JAPAN COAST GUARD	jcghkokugikaihatsu1-6r9i@mlit.go.jp
	MR.EIICHI	MASUDA	JAPAN COAST GUARD	jcghkokugikaihatsu1-6r9i@mlit.go.jp
	MR.HIROAKI	SETA	National Institute of Technology	seta@toba-cmt.ac.jp
	MR.YUSHU	HORIE	TST CORPORATION	yhorie@toyoshingo.co.jp
	MRS.YUKA	KURIOKA	TST CORPORATION	ykurioka@toyoshingo.co.jp
	MR.EISUKE	SAWADA	TST CORPORATION	esawada@toyoshingo.co.jp
KOREA Dem Pep Rep				
	CHOE	MYONG HO	KOREA SHIPOWNER'S ASSOCIATION	kicmshipping@silibank.net.kp
	JO	JONG RYONG	NAMPHO HARBOR SUPERVISION OFFICE	consultlaw@gmail.com
KOREA Rep of				
	MR.YOUNG	K BANG	DAEKEE MARINE CORPORATION	ykbang@daekee.co.kr
	MR.SANG GIL	LEE	GLOBAL CONTROL SYSTEMS CORPORATION	sglee@gcs.co.kr
	MR.GYUNG TAE	NAM	GLOBAL CONTROL SYSTEMS CORPORATION	gtnam@gcsc.co.kr
	MR.JOUNGSOO	ROH	GMT Co., Ltd.	nohawoo@gmtc.kr
	PROF.EUN-KYU	JANG	KOREA INST OF MARITIME&FISHERIES TECH	sirius46@daum.net
	PROF.JINSOO	PARK	KOREA MARITIME&OCEAN UNIVERSITY	jspark@kmou.ac.kr
	PROF.DR.HYUN YOUNG	PYO	KOREA MARITIME&OCEAN UNIVERSITY	pyo@kmou.ac.kr
	MRS.HYE-JIN	KIM	KOREA RESEARCH INST OF SHIPS(KRIS0)	hjk@kriso.re.kr
	MR.MASAYOSHI	TSUNO	MALACCA STRAIT COUNCIL	nmalacca@msc-tokyo.or.jp
	MR.MINSU	JEON	SPC SEOUL- IALA	minsuids@gmail.com
MALAYSIA				
	DATO HJ HAMDAN	ABDUL HAMID	BINTULU PORT AUTHORITY	hamdan@bpa.gov.my
	JOWEL	MUNDAT	BINTULU PORT SDN.BHD	bradon@bintulu.com.my
	JULKIP	SENO	BINTULU PORT SDN.BHD	bradon@bintulu.com.my
	BORHANA		BINTULU PORT SDN.BHD	bradon@bintuluport.com.my
	TIONG		BINTULU PORT SDN.BHD	bradon@bintuluport.com.my
	MR.ABDULLAH	JAAFAR	DEPARTMENT OF FISHERIES MALAYSIA	abj@dof.gov.my
	MR.NORAZMAN	AHMAD	FISHERIES RESEARCH INSTITUTE, KG ACHEH	anaswan612002@gmail.com
	ZULKIFLY		GREENFINDER SDN.BHD	zul@greenfinder.asia
	EZMIL		GREENFINDER SDN.BHD	ezmil@greenfinder.asia
	AZAM		GREENFINDER SDN.BHD	azam@greenfinder.asia
	MR.NORDIN	MOHAMADIN	ILPPPL	nordin@marine.gov.my
	MR.BENJAMIN BERNARD	BIJION	JABATAN LAUT LABUAN	benjamin@marine.gov.my

	Name	Last Name	Company	Email
	MR.ABDUL NASAR	ABDUL HADI	JABATAN LAUT SABAH	nasarhadi@jlsbh.gov.my
	MR.DICKSON	DOLLAH	JABATAN LAUT SARAWAK	dickson@jls.gov.my
	MR.ROSNAN	FATHLAL	JABATAN LAUT WILAYAH SELATAN	rosnan@marine.gov.my
	MR.MOHD KHAIRUL IHSAN	ISMAIL	JABATAN LAUT WILAYAH SELATAN	ihsan@marine.gov.my
	MRS.NORANITA	MD.SALLEH	JABATAN LAUT WILAYAH SELATAN	noranita@marine.gov.my
	TUAN HAJI KHAIRUDDIN	ISMAIL	JABATAN LAUT WILAYAH TENGAH	aki@marine.gov.my
	TUAN HJ.WAN ENDOK	WAN SALLEH	JABATAN LAUT WILAYAH TIMUR	wes@marine.gov.my
	CAPT.HAJI ABDUL SAMD	SHAIK OSMAN	JABATAN LAUT WILAYAH UTARA	samad@marine.gov.my
	MR.MUHAMMAD RAZIF	AHMAD	JOHOR PORT AUTHORITY	razifahmad@lpj.gov.my
	MR.KHAIRUL FAEEZ	MD IDROS	JOHOR PORT AUTHORITY	faeez@lpj.gov.my
	MR.WAN FARIDUDDIN	WAN ADNAN	JOHOR PORT AUTHORITY	fariduddin@lpj.gov.my
	CAPT. A. RAHMAN	ASMURI	JOHOR PORT BERHAD	nooredzzura@johorport.com.my
	CAPT.THOMOS	GOH	KASI(MALAYSIA)SDN.BHD	captaintomgoh@gmail.com
	MR.TAN SENG	LEONG	KASI(MALAYSIA)SDN.BHD	tansengleong@kasimalaysia.com
	MISS HUI JIN	LOW	KASI(MALAYSIA)SDN.BHD	lowhuijin@kasimalaysia.com
	DATUK CAPTAIN	NAIR	KASI(MALAYSIA)SDN.BHD	wjnair@kasimalaysia.com
	MR.BEN	NAIR	KASI(MALAYSIA)SDN.BHD	benjamin.nair@kasimalaysia.com
	MISS JEANETTE	NAIR	KASI(MALAYSIA)SDN.BHD	jeanette.nair@kasisingapore.com
	MR.RICHARD	SONG	KASI(MALAYSIA)SDN.BHD	song.rich@gmail.com
	CAPT.KAMARUZAMAN	IDRIS	KUANTAN PORT CONSORTUIM SDN.BHD	info@kuantanport@ijm.com
	MR.MININ	ANAK ETAMIN	KUCHING PORT AUTHORITY	hrdo@kuport.com.my
	MININ		LEMBAGA BOYA & API BINTULU	minin@kuport.com.my
	MR.AWANG PUTARAKASUMA	AWANG DOLHAN	LEMBAGA BOYA & API SARAWAK	putarakd@sarawak.gov.my
	MR.BAKRI	JURONG	LEMBAGA BOYA & API SARAWAK	bakri@kuport.com.my
	MR.PETER ONG	YIL BOON	LEMBAGA BOYA & API SARAWAK	yiiboon@gmail.com
	MR.IKHBAR	MASHARI	LUMUT MARITIME TERMINAL SDN BHD	ikhbar@lumutport.com
	ZAINUDDIN	MOHD TARMIZZI	MALAYSIA SHIPOWNER ASSOCIATION	general@masa.org.my
	MR.MOHD AZMI	ABDULLAH	MALAYSIAN FISHERIES ACADEMY, TERENGANU	azmi@dof.gov.my
	MR.ABDUL AZIZ	MUDA	MALAYSIAN FISHERIES COLLAGUE, LUMUT	intan@dof.gov.my
	CHONG	CHEE WAH	MALAYSIAN MARITIME ACADEMY SDN.BHD (ALAM)	chongcheewah@alam.edu.my
	CAPT. LEE	GHIM TECK	MALAYSIAN MARITIME ACADEMY SDN.BHD (ALAM)	lee_ghimteck@alam.edu.my
	CAPT. DR. MARIVANNAN		MALAYSIAN MARITIME ACADEMY SDN.BHD (ALAM)	marivannan@alam.edu.my
	MR.MOHD ARMA NORAMIN	A.RASHID	MARINE DEPARTMENT MALAYSIA	arma@marine.gov.my
	TUAN.HJ KHAIRUDIN	ABBAS	MARINE DEPARTMENT MALAYSIA	
	MR.FAZALY	ABD.LATIP	MARINE DEPARTMENT MALAYSIA	

	Name	Last Name	Company	Email
	MOHD.SHUHAIMI	ABD.RAHMAN	MARINE DEPARTMENT MALAYSIA	suhaimi@marine.gov.my
	TUAN HJ.MOHD HAFIZ	ABDUL MAJID	MARINE DEPARTMENT MALAYSIA	
	MOHD.AZHAN	ABDULLAH	MARINE DEPARTMENT MALAYSIA	
	CAPT.NAZRI	ABU HASSAN	MARINE DEPARTMENT MALAYSIA	
	TUAN.HJ.GHADZALI	AHMAD	MARINE DEPARTMENT MALAYSIA	
	MOHD.ALIFF	AHMAD	MARINE DEPARTMENT MALAYSIA	
	CAPT.ROSLI	AHMAD	MARINE DEPARTMENT MALAYSIA	rosli@marine.gov.my
	CAPT.MOHAMAD HALIM	AHMED	MARINE DEPARTMENT MALAYSIA	halim@marine.gov.my
	MR.HAIRIZAM	ALBUKHARI	MARINE DEPARTMENT MALAYSIA	hairizam@marine.gov.my
	MOHAMMAD HISHAM	ALI	MARINE DEPARTMENT MALAYSIA	
	MR.SYAMSUL AMINUDDIN	AMAT	MARINE DEPARTMENT MALAYSIA	syamsul@marine.gov.my
	MR.ALIMUDDIN	AMIRUDIN	MARINE DEPARTMENT MALAYSIA	alimuddin@marine.gov.my
	MR.JASARI	AWANG	MARINE DEPARTMENT MALAYSIA	jasari.marine@1govuc.gov.my
	DATO'ABDULLAH YUSOFF	BASIRON	MARINE DEPARTMENT MALAYSIA	abdullah@mot.gov.my
	DATO' BAHARIN	DATO'ABDUL HAMID	MARINE DEPARTMENT MALAYSIA	baharin@marine.gov.my
	MR.VALERIAN SHEM	DONGGOT	MARINE DEPARTMENT MALAYSIA	
	DATO' PAHLAWAN ZAAIM	HASSAN	MARINE DEPARTMENT MALAYSIA	zaaim_hassan@yahoo.com
	MR.AZIZUL HALIMI	HUSAIN	MARINE DEPARTMENT MALAYSIA	azizulh@marine.gov.my
	DATO'HAZMAN	HUSSEIN	MARINE DEPARTMENT MALAYSIA	hazman@marine.gov.my
	MR.IZZAMUDIN	IBRAHIM	MARINE DEPARTMENT MALAYSIA	izzamudin@marine.gov.my
	DATO'CAPT.JAILANI	JALAL	MARINE DEPARTMENT MALAYSIA	jai@marine.gov.my
	DATO'CHUA	KOK CHING	MARINE DEPARTMENT MALAYSIA	ckc@mot.gov.my
	MR.ROSLEE	MAT YUSOF	MARINE DEPARTMENT MALAYSIA	roslee@marine.gov.my
	MR.SHAHLAN	MD.SHUKOR	MARINE DEPARTMENT MALAYSIA	
	DR.JULYUS	MOBILIK	MARINE DEPARTMENT MALAYSIA	julyus@marine.gov.my
	DATO'ROSSID	MUSA	MARINE DEPARTMENT MALAYSIA	rossid@marine.gov.my
	MR.BIANUS	MUYOU	MARINE DEPARTMENT MALAYSIA	bianus.marine@1govuc.gov.my
	MR.ABDUL HADI	NORDIN	MARINE DEPARTMENT MALAYSIA	hadi@marine.gov.my
	TUAN.HJ.MAJID	RAIS	MARINE DEPARTMENT MALAYSIA	majid@marine.gov.my
	MRS.RAHAYU	RAJALI	MARINE DEPARTMENT MALAYSIA	
	MR.MOHD NORFUAD	REME	MARINE DEPARTMENT MALAYSIA	norfuad@marine.gov.my
	MR.FAIROZ	ROZALI	MARINE DEPARTMENT MALAYSIA	fairoz@marine.gov.my
	CAPT.SUKHBIR	SINGH	MARINE DEPARTMENT MALAYSIA	
	MR.NUR MUHAMMAD	SUBRI	MARINE DEPARTMENT MALAYSIA	muhammad@marine.gov.my
	MR.MOHD NURRUL FAIZ	TAIB	MARINE DEPARTMENT MALAYSIA	nurrulfaiz@marine.gov.my
	MR.ARUMUGAM	V SUBRAMANIAM	MARINE DEPARTMENT MALAYSIA	arumugam@marine.gov.my
	TUAN.HJ AZUDIN	ZAINAL ABIDIN	MARINE DEPARTMENT MALAYSIA	

	Name	Last Name	Company	Email
	TUAN.HJ BAHARUDDIN	ZAKARIA	MARINE DEPARTMENT MALAYSIA	
	MISS LUNG	SAI MEI	MINISTRY FINANCE MALAYSIA	
	CAPT.SHANKAR	GOVINDASAMY	MISC BERHAD	g.shankar@miscbhd.com
	CAPT.MOHD JASMIN	NORDIN	MISC BERHAD	mjasmin.nordin@miscbhd.com
	CAPT.ATUL	WADHWA	MISC BERHAD	atul.wadhwa@miscbhd.com
	FAIZ		PELABUHAN TG. PELEPAS SDN. BHD	faiz@ptp.com.my
	MOHD ABDUL RAZAK		PELABUHAN TG. PELEPAS SDN. BHD	mrazak@ptp.com.my
	WONG	MING CHONG	PINC TECHNOLOGY SDN. BHD	zul@greenfinder.asia
	NIR RAHIM	ADNAN	PORT KLANG AUTHORITY	nirrahim@pka.gov.my
	ELYAS	KHAIRI	PORT KLANG AUTHORITY	elyas@pka.gov.my
	MUZAMMIL	MOKHTAR	PORT KLANG AUTHORITY	muzammil@pka.gov.my
	CAPT.AKASHAH	MD DOM	PORT OF TANJUNG PELEPAS	akashah@ptp.com.my
	MR.NADARAJ	CHIDAMBARAM	PUNCAK TEKNOLOGI (M) SDN. BHD.	raj@puncak.com.my
	GOH CHEE CHUAN	ALLEN	SARAWAK RIVERS BOARD	geometryrealty@gmail.com
	MR.LEO	NANANG	SARAWAK RIVERS BOARD	leo@srb.gov.my
	MR.MAZLAN	IDRUS	SELANGOR WATERS MNGMNT AUTHORITY	mazlan@luas.gov.my
	CAPTAIN ZANIF	HASHIM	T.A.G MARINE SDN.BHD	czh@tag-marine.com
	RAJA DATUK MALIK	RAJA KAMARUZAMAN	T.A.G MARINE SDN.BHD	malik@tag-marine.com
	MR.LATIFF	COUPON	TANJUNG MANIS PORT AUTHORITY	latiffc64@gmail.com
NETHERLANDS				
	MR.WIM	van 't PADJE	Marine Services & Simulation Projects	Padje@stc-r.nl
	MR.MAARTEN	BERREVOETS	Ministry of Infrastructure & Environment	maarten.berrevoets@minienm.nl
	MR.REMI	HOEVE	Ministry of Infrastructure & Environment	remi.hoeve@rws.nl
	MRS.LILIAN	BIBER-KLEVER	NNVO	lbiber@nnvo.nl
	CHRISTIAN	VAN BEEST	ORGA BV	c.vbeest@orga.nl
	MR.BEN	ROHNER	PORT OF ROTTERDAM AUTHORITY	b.rohner@portofrotterdam.com
	MR.PIETER	PAAP	RIJKSWATERSTAAT	pieter.l.paap@quicknet.nl
	MR.RENE	HOGENDOORN	SAAB TECHNOLOGIES	rene.hogendoorn@saabgroup.com
NIGERIA				
	MR.LEONARD	EKECHI	NIGERIAN MARITIME ADMINISTRATION	contact@iala-aism.org
NORWAY				
	MR.STEVE	GUEST	KONGSBERG NORCONTROL IT	steve.guest@kongsberg.com
	MR.PER-ERIK	KRISTOFFERSEN	KONGSBERG NORCONTROL IT	per-erik.kristoffersen@kongsberg.com
	MR.LOI HEIN	PAU	KONGSBERG NORCONTROL IT	loi.hein.pau@kongsberg.com
	MR.TODD	SCHUETT	KONGSBERG NORCONTROL IT	todd.schuett@kongsberg.com
	MRS LENE	VESTERLUND	KONGSBERG NORCONTROL IT	lene.vesterlund@kongsberg.com
	MR.TONY	HAUGEN	KONGSBERG SEATEX AS	tony.haugen@kongsberg.com

	Name	Last Name	Company	Email
	MR.RICHARD	AASE	NORWEGIAN COASTAL ADMIN	richard.aase@kystverket.no
	MS.MALIN	DREIJER	NORWEGIAN COASTAL ADMIN	malin.dreijer@kystverket.no
	CPT..JON LEON	ERVIK	NORWEGIAN COASTAL ADMIN	jon.leon.ervik@kystverket.no
	MR.TROND	SKI	NORWEGIAN COASTAL ADMIN	trond.ski@kystverket.no
	MR.JOHN ERIK	HAGEN	NORWEGIAN COASTAL ADMINISTRATION	john.erik.hagen@kystverket.no
	MR.PETER	EADE	VISSIM AS	peter.eade@vissim.no
RUSSIA				
	MR.EVGENY	KUZOVINSKIY	ROSMORPORT	e.kuzovinsky@rosmorport.ru
SINGAPORE				
	MR.GREGORY	SINIKOV	DONGJOO ENGINEERNG CO.LTD	gregsin@dongjoo.sg
	CAPT.HENRY	HENG	MARITIME PORT AUTHORITY OF S'PORE	
	CAPT.M	SEGAR	MARITIME PORT AUTHORITY OF S'PORE	
	CAPT.TEO	TZE KERN	MARITIME PORT AUTHORITY OF S'PORE	Teo_Tze_Kern@mpa.gov.sg
	MR.KELVIN	TINGG	SINGAPORE TECHNOLOGIES ELECTRONICS	tingzhenee.kelvin@stee.stengg.com
	MR.YOSHIHITO	KIMURA	THE JAPAN ASSOCIATION OF MARINE SAFETY	tjams@singnet.com.sg
	MR.MATHEW	MATHAI	THE JAPAN ASSOCIATION OF MARINE SAFETY	
	MR. ASAI	TOSHITAKA	THE JAPAN ASSOCIATION OF MARINE SAFETY	tjams@singnet.com.sg
	MR.YURI	ISHUTIN	TRANSAS	yuri.ishutin@transas.com
SOUTH AFRICA				
	CAPT.KARL	OTTO	SOUTH AFRICAN MARITIME SAFETY AUTHORITY	karlooto.away@gmail.com
	SEUNGHEE	CHOI	KOREA INSTITUTE OF MARITEME AND FISHERIES TECHNOLOGY	seunghee.choi.1017@gmail.com
SPAIN				
	MR.AZIMBAZRI	ABD SHUKOR	MEDITERRANEO SENALES MARITIMAS(MSM)	aycity@gmail.com
	MR.CARLOS FERNANDEZ	SALINAS	Sociedad de Salvamento y Seguridad Marítima	jcarlosfs@centrojovellanos.com
SWEDEN				
	MR.MARCUS	GUSTAFSSON	SAAB	marcus.c.gustafsson@saabgroup.com
	MR.NIKLAS	STJARNSKOG	SAAB TRANSPONDER TECH	niklas.stjarnskog@saabgroup.com
	MR.ANDERS	JOHANNESSON	SWEDISH MARITIME ADMINISTRATION	anders.johannesson@sjofartsverket.se
	CPT. FREDRIK	KARLSSON	SWEDISH MARITIME ADMINISTRATION	fredrik.karlsson@sjofartsverket.se
	MISS MONICA	SUNDKLEV	SWEDISH TRANSPORT AGENCY	monica.sundklev@transportstyrelsen.se
TAIWAN				
	MR.GARRY	KAO	YANGTECH ENGINEERING CO.,LTD	hgarry@yangtech.com.tw
TURKEY				
	MR.BURCIN	ERLEVENT	DIRECTORATE GENERAL COASTAL SAFETY	burcin.erlevent@kegm.gov.tr

	Name	Last Name	Company	Email
	CAPT.TUNCAY	ÇEHRELI	DIRECTORATE GENERAL COASTAL SAFETY	tcehreli@kegm.gov.tr
UK				
	MR.KEVIN	GREGORY	INT.HARBOUR MASTERS ASSOC	kevin.gregory@pla.co.uk
	CAPT.KEVIN	RICHARDSON	INT.HARBOUR MASTERS ASSOC	
	MR.THOMAS	SOUTHALL	INT.HARBOUR MASTERS ASSOC	tom.southall@pla.co.uk
	MR.NICHOLAS JOHN	CUTMORE	International Maritime Pilots Association	office@impahq.org
	Mr.JOHAN	GAHNSTROM	INTERTANKO	johan.gahnstrom@intertanko.com
	CAPT.JOHN	LlYOD	THE NAUTICAL INSTITUTE	john.lloyd@nautinst.org
USA				
	MS.MARGARET /PEGGY	BROWNING	EXACTEARTH	margaretakapeggy@yahoo.com
	CAPTAIN PETER	DOLAN	PHAROS MARINE AUTOMATIC POWER	pdolan@automaticpower.com
VIETNAM				
	MR.TRUONG	MINH TRI	MARITIME ADMINISTRATION OF HO CHI MINH	minhtrivtsvn@yahoo.com
	MR.VU QUANG	THANH	MARITIME ADMINISTRATION OF HO CHI MINH	thanhvucvsg@yahoo.com
- -				
	SANTORO	CLAVDIO		

ANNEX B ADDRESS BY DATO' BAHARIN BIN DATO' ABDUL HAMID, DG MARINE DEPARTMENT MALAYSIA

HONORABLE DATO' AB. AZIZ KAPRAWI

Deputy Minister of Transport Malaysia

His Excellency, Mr.Kitack Lim,

Secretary General the International Maritime Organization,

Mr. Francis Zachariae,

Secretary General the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA),

Captain. Mohamad Halim Ahmed,

Chairman of the Organizing Committee of THE 13TH INTERNATIONAL VTS SYMPOSIUM 2016.

Excellency, Distinguished Guests, Ladies and Gentlemen,

ASSALAMUALAIKUM W.R.T W.B.T, and very GOOD MORNING

First and foremost, I would like to thank the honourable minister for considering and taking his time off from his hectic schedule to be with us today. My special thanks to the International Association of Marine Aids to Navigation and Lighthouse Authorities Secretariat, Ministry of Transport, Light Dues Board, Marine Department Malaysia and Malaysia Maritime Institute, for jointly and organize the 13th International Vessel Traffic Service Symposium 2016 in Kuala Lumpur.

Just to recap, at the 55th Meeting of IALA Council in Busan, South Korea in May 2013, Malaysia was chosen as the organizer for the 13th VTS International Symposium. We are honoured to have such privilege and be given the opportunity to organize this event. Since then, as a host to this symposium, we have been working closely with the IALA to assist and oversee the organization of this symposium in Malaysia.

Distinguished Guests, Ladies and Gentlemen,

I am pleased to inform that there are over 250 participants from 100 countries attending this symposium. There are 44 exhibitors who are being exhibiting their latest products, which you would have the opportunity to visit during the course of the symposium. I am confident that you may find some of the product that of great interest to you.

Last week, we have successfully hosted the VTS 42nd Session Committee Meeting. After the meeting on the weekend, we had a technical visit to Pulau Undan Lighthouse which was built in 1880. Next to the lighthouse there is a VTS radar tower that forms part of Strait of Malacca VTS network. Recently, we have undertaken extensive restoration work to preserve the lighthouse to its original form. On Thursday, 11th of August there is a programme to visit to the Vessel Traffic Monitoring Service Centre in Westports, Port Klang.

As important as it is for the delegates to attend the 13th International VTS Symposium, it is also important for us to ensure that the delegates' spouses and families feel welcomed to our beautiful country and because of that, we have arranged a special 'SPOUSE PROGRAMME' that will last for 2 days, each day as a day trip.

For our first destination which will take place on Tuesday, we will take you on an adventure to one of our most historical state, The Historical City of Malacca. After an enticing day at Malacca, we will take you to the heart of Malaysia, Kuala Lumpur the following day where you will be a part of the Malaysian urban culture and a special celebrity chef, Chef Wan will join us, demonstrating his skills in culinary and for a scrumptious lunch at the National Palace.

Distinguished Guests, Ladies and Gentlemen,

Before ending I would like to thank again the IALA Secretariat, the Marine Department of Malaysia, MIMA and the Light Dues Board for their hard work in organising and making this symposium a success. And to our domestic and international partners, who have contributed tremendously. I sincerely hope that the symposium will be conducted smoothly with fruitful deliberations and discussion to further the objectives of IALA.

Last but not least, whilst you are here in Kuala Lumpur please spare some time to visit the vibrant Kuala Lumpur and do enjoy the hospitality that Malaysia has to offer, especially for those who are here in Kuala Lumpur for the first time.

Thank you

ANNEX C ADDRESS BY MR FRANCIS ZACHARIAE, SECRETARY-GENERAL OF IALA

Deputy Minister Datuk Aziz Bin Kaprawi, Secretary-General Kitack Lim, Director General Dato Bahrin Bin Dato Abdul Hamid, Symposium Participants, Ladies and Gentlemen,

It is my pleasure to welcome you all to the 13th International Symposium on Vessel Traffic Services in Kuala Lumpur, the vibrant and multi-faceted capital of Malaysia - truly Asia. It is four years since the previous Symposium took place in Istanbul and I have no doubt that we will have just as much and perhaps even more to discuss at this Symposium, which takes place in one of the fastest developing maritime regions in the world and at a short distance of the important Strait of Malacca. I am sure we all are very much looking forward to learning more about the Malaysian experience with Vessel Traffic Services and the visit to the VTS Centre located at Port Klang will be an added bonus, bearing in mind that Port Klang is also the principal gateway to the country for its connections with the sea and international shipping. These connections are of critical importance for building and expanding Malaysia's maritime economy.

Malaysia can be truly proud of its efforts to host this Symposium at such a high standard of pre-planning, organizational logistics and, may I add, Malaysian charm and elegance. I and my colleagues in the IALA Secretariat are truly grateful to the Government of Malaysia and the Marine Department for the excellent as well as very generous support with regard to the wide array of practical matters involved in organizing an international event of this size. I also have appreciated enormously the close cooperation in developing the vision and charting the direction for this Symposium, which are reflected in the many pertinent themes covered by the sessions planned for this week.

I would like specifically to mention the hard work done by Capt. Mohmad Halim Bin Ahmed and his team and the Chairman of the IALA VTS Committee Capt. Tuncay Cehreli.

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I feel particularly honoured that the Deputy Minister has created time in his busy schedule to be here with us today and thank him for that, and I look forward to his address.

I also wish to thank IMO Secretary-General Kitack Lim for having graciously agreed to present the Keynote Address and all the support to IALA.

Standing where I am, it is wonderful to see such a large audience. Many of you have travelled a long way to be here, and this goes to show the enthusiasm for meeting other representatives of many countries from around the world and from international organizations, technical experts, researchers and academia – the IALA Family as we like to call it.

I am also particularly pleased that the popular Exhibition is once again taking place and wish to welcome and thank all the exhibitors and the IALA Industrial Members for their splendid efforts to bring such a good show to Kuala Lumpur. I would encourage everybody to take full advantage of the opportunity to visit the Exhibition and see first-hand what world leaders in research and technology development and manufacturers of equipment manage to achieve in the VTS arena. Nothing compares with meeting the experts face-to-face and engaging in detailed discussions face-to-face, which provides an intensity and a quality that cannot be matched by e-mail correspondence.

In IALA we like to think that VTS is the front office of e-Navigation and I am sure you can see in the exhibition area that e-Navigation is already here and influencing or assisting in particular the VTS centres.

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The benefits of so many different interest groups in an international context and with a cooperative spirit is all the more significant if we consider that promoting Vessel Traffic Services serves the common interest and common goal of streamlining standards and harmonizing practices. This can only be good for the principal users of VTS, and increasingly also of e-Navigation: the mariners, as represented by the multi-national and multi-cultural crews working in the service of ocean transportation. Seafarers need a harmonized approach to VTS standards and practices.

The beauty of harmonization is that it eliminates ambiguity. It leaves no room for confusion over what is expected. Confusion constitutes a risk to both safety and efficiency, and that is why harmonization is so important. Global harmonization is therefore also the principal aim of IALA.

Further in this regard, the programme this week includes a number of presentations on the relationship between VTS and e-Navigation. One of the conclusions of the Istanbul Symposium was that VTS is firmly established as a focus for information exchange and plays an important role in the maritime transport domain – a role that has been proven to be cost effective in terms of contributing to the safety of navigation, efficiency of vessel traffic and protection of the marine environment. The role of VTS is expanding and this brings with it a greater impact of VTS on e-Navigation and vice versa. The uses of the sea become more varied and this brings with it greater complexity. The manoeuvrable space for shipping is being challenged by this expanding utilization and larger ships and the need for more pro-active management of vessel traffic in the areas concerned is therefore likely to increase as well, further driving the interaction between ships and shore authorities. The role of VTS, far from becoming reduced as a result of this emerging trend, becomes more central and the capabilities offered by e-Navigation and its Maritime Service Portfolios will offer new opportunities for supporting this enhanced, central role of VTS. Again, the concepts of domain awareness, monitoring and management – and of Marine Spatial Planning – come into play. And the combination of all this, if handled properly, will help us to deal more effectively with the challenges for safe, secure and efficient navigation in clean waters.

Furthermore, there is increasing awareness, public perception of, and expectation for VTS. This places an enhanced degree of accountability on maritime administrations and their management of VTS.

The full potential of VTS is yet to be realized – was a conclusion from Istanbul. What is already clear to me is that e-Navigation will play a critical role in maximising the benefits of VTS. I regard this 13th International VTS Symposium very much as an opportunity to continue our efforts to bring this emerging trend to fruition.

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I now wish to turn briefly to the chosen theme for our Symposium: “Sustainable Safe Navigation”. The term “sustainable” may be very much in vogue, but we did not choose it for its ‘buzzword’ attraction, but rather because sustainability is now widely considered as essential to the longer-term viability of maritime transportation. It implies that we must strive to maintain the right balance between what may sometimes appear to be conflicting forces working in opposite direction or against each other, thus reducing their respective beneficial impact. In the shipping world, we are constantly confronted with the dynamic – and often stressed – interaction between maximising commercial gain, on the one hand, and, on the other, the necessity of investing in improved safety even when market conditions suggest that cost cutting should have priority. However, there is a growing recognition that the two objectives of commercial gain and improved safety are not mutually exclusive and indeed can support each other. It may be a cliché to say “If you think safety is expensive, try an accident”, but it nevertheless is the truth.

In the particular case of marine navigation and maritime traffic information, monitoring and management, there is overwhelming opportunity, thanks to the pace and the volume of technological advances, to increase efficiency while at the same time creating safer navigational practices and a safer overall traffic situation. The concepts of domain awareness and marine spatial planning should make us think more about improving our understanding – and our techniques – for better risk assessment. Risk management enables VTS to be proactive in mitigating risk and improving logistics. The programme this week offers plenty of scope for fruitful discussion on these encouraging developments and for finding ways of better detecting and targeting risk factors.

One such factor is of course the all-important human element. Incidents and accidents continue to happen all too often and it is entirely appropriate that this week’s programme devotes a whole session to the role of VTS in incident response including decision support for improved incident and crisis management. Human factors management can play a significant role in maximising the performance of a VTS.

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Ladies and gentleman,

I would encourage everybody to be an active participant in the Question and Answer sessions, which are provided for the purpose of engaging all participants and allowing them to bring their own knowledge, expertise, insights and views to bear on the listening-and-learning event that a Symposium of this kind entails. The importance of sharing information and knowledge has always been at the heart of IALA and has made its technical work possible.

Once more thanking our host – the Marine Department Malaysia - I conclude my welcome address and wish you all a fruitful, successful and enjoyable Symposium and a very pleasant stay in Kuala Lumpur.

Thank you.

ANNEX D KEYNOTE ADDRESS BY MR KITACK LIM, SECRETARY-GENERAL OF IMO

Ladies and gentlemen,

It is a pleasure to be here with you today and I am grateful for the opportunity to say a few words as we begin this important symposium on vessel traffic services in this beautiful city, Kuala Lumpur.

I would like to start by thanking the Marine Department of Malaysia and the Malaysian Ministry of Transport for hosting us. And I would like to congratulate IALA for organizing this event, which takes place every four years, providing a forum for delegates from governments, competent authorities and VTS services around the world to review the past few years and discuss the current challenges and opportunities in VTS and domain awareness. I know from personal experience the distinct role VTS plays and the value thereof.

IALA of course has a long association with IMO, having consultative status since 1961. It plays an active part in discussions relating to safety of navigation and in developing the e-navigation concept. Through the delivery of aids to navigation and the improvement and harmonization of VTS worldwide – IALA plays a vitally important role in fostering efficient, economic and safe movement of vessels, which in turn helps protect the marine environment.

I am pleased that you have chosen the theme "Sustainable Safe Navigation" for this 13th international VTS symposium. As part of the United Nations family, IMO is actively working towards the 2030 Agenda for Sustainable Development that world leaders pledged to support in 2015, with a set of clear Sustainable Development Goals. Most of the elements of that Agenda will only be realized with a sustainable maritime transport sector supporting world trade and facilitating the global economy.

Safety of navigation at sea – protecting people and ships, preventing collisions and thereby protecting the marine environment – is a vital element in maintaining the sustainability of shipping. I think looking at this theme from a sustainability angle also helps us focus on the future and what technology and innovation might offer. I know that the coming days will provide ample opportunity to discuss where we are now and how VTS might look in the future and ways to ensure "sustainable safe navigation". New technologies and innovation and e-navigation feature heavily on your programme this week. I have noted sessions on the "Convergence of VTS and e-Navigation" and "VTS in the Age of the Digital Information", to name but two.

In IMO's strategic plan for the implementation of e-navigation – which refers to the harmonized collection, integration, exchange, presentation and analysis of marine information on board and ashore – we include a priority task relating to "Improved communication of VTS service portfolio (not limited to VTS stations)". This task needs to identify the possible communications methods that might be used and test beds need to be built to demonstrate which systems are best in different areas of operation, such as deep sea, coastal and port.

These are exciting times in which we might consider an increasing role of VTS and its capabilities. 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.

We might also consider how data generated by existing and new VTS systems might in the future contribute even more to decision-making on a broader level, such as at IMO.

Technology has moved on a lot since the advent of radar provided the opportunity to accurately monitor and track shipping traffic and led to the first formal VTS systems being established in the mid-20th century. IMO recognized the importance of VTS in Assembly resolutions adopted in 1968 and 1985.

In 2000, IMO adopted the International Convention for the Safety of Life at Sea (SOLAS) regulation V/12 *Vessel Traffic Services* which clarifies the role of Vessel Traffic Services (VTS) in contributing to safety of life at sea, safety and efficiency of navigation and protection of the marine environment, adjacent shore areas, work sites and offshore installations from possible adverse effects of maritime traffic. The regulation also outlines the role of Governments and, importantly, makes it clear that the decision as to the provision of VTS lies with the national authorities.

The associated Revised Guidelines for Vessel Traffic Services, including Guidelines on Recruitment, Qualifications and Training of VTS Operators, were adopted as Assembly resolution A. 857(20) in November 1997. Although they were published almost 20 years ago, they still provide an excellent framework for Vessel Traffic Services, alongside the *IALA standards for training and certification of VTS personnel,* which have been updated in recent years and have been recognized as an industry standard through an IMO Maritime Safety Committee circular.

Indeed, IALA has made a crucial contribution by working together with IMO and its Member States in the development and review of VTS-related documentation on issues such as the qualification 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.

While the development of guidelines and standards is vitally important, it is equally crucial for Contracting Governments and Competent Authorities to ensure that these are implemented. Only full, smart and effective implementation of a harmonized VTS service is extremely important for the safety and efficiency of navigation and protect the marine environment, not at least in coastal and port areas.

This requires a focus on capacity building and training and so I am pleased to see that you have a session addressing "Training and Competency" which asks the question whether "the shore is lagging behind the bridge?".

This is an interesting theme which I hope to see further addressed next year when our IMO World Maritime Day theme will be: "Connecting Ships, Ports and People", building on our theme for this year which is "Shipping: indispensable to the world". We intend to take the ships-ports-people theme as a starting point in looking at training and capacity building and working with developed and developing countries in linking the ships and shore-side activities and all those involved.

Of course, there are many excellent, collaborative initiatives specifically focusing on VTS. One example is the Association of Southeast Asian Nations (ASEAN)-Japan Regional Project on VTS Operator Training at the Maritime Transport Training Institute in Malaysia. Under this initiative, a Regional Training Center for VTS personnel was established for ASEAN countries, which will allow VTS operators of those countries to be trained effectively and in a harmonized manner.

I would also like to congratulate IALA on its initiative in establishing the IALA World Wide Academy (WWA), which commenced operations in 2012, and aims to make VTS and Aids to Navigation training accessible to all, through the development of national centres. These are also available for the personnel of neighbouring States. This is exactly the kind of positive cooperation that will help to drive progress in the coming years.

And this 13th International VTS Symposium also embodies that spirit. The three "C"s: cooperation, collaboration and communication are essential, not least when pursuing global goals and aspirations that require countless countries, organizations, authorities and individuals to work together.

VTS can also support safe navigation and protection of the marine environment alongside other tools, which themselves can service the VTS.

Not too far away from here we have the Marine Electronic Highway in the Straits of Malacca and Singapore, where besides VTS to assist safe navigation through a defined part of the Straits, there is a network of electronic navigational charts using Electronic Chart Display and Information Systems (ECDIS) and environmental management tools, all combined in an integrated platform covering the region that allows the maximum of information to be made available both to ships and shipmasters as well as to shore-based users, including Vessel Traffic Services.

Ladies and gentlemen,

I wish you fruitful and enjoyable discussions during the coming days.

This symposium's theme of "Sustainable Safe Navigation" is not only necessary – but achievable. For IMO's part – we will continue to work hard to provide a smart, robust regulatory framework that ensures safe, secure, efficient shipping on clean oceans – helping to create conditions for a sustainable blue economy.

And I would like to reiterate that the worldwide harmonized implementation of Vessel Traffic Services continue to be a very important objective of IMO and IALA, as we continue in our pursuit of even more safe, efficient and environment-friendly shipping.

Thank you.

ANNEX E OPENING SPEECH BY DATUK AB. AZIZ KAPRAWI, DEPUTY MINISTER OF TRANSPORT MALAYSIA

His Excellency Mr. Kitack Lim, Secretary General International Maritime Organization

Mr. Francis Zachariae, Secretary General International Association of Marine Aids to Navigation and Lighthouse Authorities

Dato' Hj. Baharin Dato' Abdul Hamid, Director General Marine Department Malaysia

Captain Mohamad Halim Ahmed, Chairman of the Organizing Committee THE 13TH INTERNATIONAL VTS SYMPOSIUM 2016

Distinguished Guests, Ladies and Gentlemen,

It gives me a great pleasure to welcome all delegates, exhibitors and guests to the 13th Vessel Traffic Services Symposium 2016. This event is jointly organized by the International Association of Marine Aids to Navigation and Lighthouse Authorities, Marine Department Malaysia, Malaysia Maritime Institute and Light Dues Board. I would like to express my heartfelt thanks the organisers for their hard work and tireless effort in the preparation of the symposium.

Malaysia has been a member of IALA since 1962 and was first elected as council member in 2002. Since then Malaysia has taken part in many IALA forums, seminars, symposiums, meetings and conferences. Last year Malaysia hosted the 60th IALA council meeting in May at Kuala Lumpur. Malaysia remains committed to play important its role as an IALA member. Being a member of council of the IALA we have participated actively in all IALA proceedings.

The chosen theme for this symposium is Sustainable Safe Navigation where current challenges and opportunity in vessel traffic services will be considered by the forum. Vessel Traffic Services or commonly known as VTS is one of the pillars for a sustainable safe navigation for shipping. Throughout this symposium, I expect there will be many active exchanges of opinions and ideas and lively debate relating to provision, operation, maintenance and use of VTS.

Distinguished Guests, Ladies and Gentlemen,

The first VTS in Malaysia was established in 1982 in the Port of Bintulu. It was introduced to manage the shipping traffic coming in and out of the Port which was mainly LNG carrier that was of high safety risk. The port VTS helps a seamless and accidents-free shipping in Bintulu Port until today. The benefit of VTS in this case was evidently clear and proven which allows Malaysia to export millions on tonnes of LNG safely for the past three decades. From then on, Malaysia has extended VTS to other ports to enhance the safe operation in Malaysia ports.

The development of VTS in Malaysia has seen rapid increase in recent years proven by the number of VTS operators. As of today, we have at least 10 VTS operators in Malaysia including the coastal surveillance in the Straits of Malacca. The Malacca Straits coastal surveillance was established in 1998, through the implementation of the Malacca Straits Reporting or STRAITREP in accordance with IMO resolution MSC.73 (69).

In order to cope with the current shipping trend and challenges, I am pleased to inform that the government of Malaysia has plans to build new VTS Centre infrastructure in Port Kelang. This infrastructure will not only house the latest technology in VTS and aids to navigation monitoring system but also will be manned by competent and qualified VTS personnel.

The importance of capacity building and technical cooperation are vital for the development of the VTS. Hence, I am also pleased to announce a technical cooperation between ASEAN and Japan has been agreed where Malaysia is the project proponent. The ASEAN VTS Regional Training Centre is first of its kind and we are honoured that the Maritime Transport Training Institute known as MATRAIN located at Pulau Indah, Port Kelang has been chosen to host this training programme. The first training program is scheduled to commence in the middle of 2017.

An Expert Group of ASEAN Regional for VTS had their meeting on 2nd August 2016. The meeting discussed the establishment of ASEAN Regional Training Centre for VTS operators at MATRAIN and developed the framework for the VTS training programme. As a host to this programme, we are eagerly look forward for this initiative to come to realisation.

Distinguished Guests, Ladies and Gentlemen, Safety of navigation for shipping has always been a primary agenda for Malaysia. Malaysia commitment remain high for maintaining safe navigation for ships and for that reason, I am pleased to inform that Malaysia have procured a 82 meter buoy tender vessel to expand our capability in maintaining aids to navigation. Its operation area will not only limit to the Strait of Malacca but also the whole of Malaysian waters. This vessel will also serves as a training platform for Marine Department personnel in the field of VTS and aids to navigation.

I could never say enough that training of personnel either ashore or ship based is a fundamental element in the field of safety of navigation. For that reason, IALA entrusted MATRAIN to conduct the Level One Aids to Navigation Manager Training Course. The recognition given to MATRAIN to conduct this high skill international course has put Malaysia at the centre stage for human resource capacity building in this region.

Both these notable achievements in the development of human resource capacity building for aids to navigation and VTS shall be penned down through signing of a Memorandum of Understanding between IALA and Malaysia for the Level One Ads to Navigation Manager Training Course; and an exchange of official documents between Japan and Malaysia to endorse the cooperation for ASEAN Regional Training for VTS Personnel. The signing and exchange of documents will take place at the Conference Hall 1 later today.

Distinguished Guests, Ladies and Gentlemen,

To mark this auspicious event, commemorative stamps shall be issued by Pos Malaysia. The commemorative stamps symbolises the highest cooperation between Malaysia and IALA in making efforts towards “Sustainable Safe Navigation”. Along with this, an International IALA VTS Manual 6th edition will also be formally launched.

Taking the opportunity of the symposium this week here in Kuala Lumpur, a coffee table book, titled, “Safety of Navigation Modernisation: Monitoring Ships” will be launched. This book is an initiative taken by the Light Dues Board in promoting awareness in VTS. It provides readers with general background of VTS and some insight of efforts taken by Malaysia to enhance safety of navigation in its waters. The book is written by a group of officers in the Marine Department Malaysia and I believe it will add on to the series of literatures and references on aids to navigation for of those who have interest in this subject.

Distinguished Guests, Ladies and Gentlemen,

Before I conclude my speech, once again I would like to thank you for making the symposium a success. I hope in the next few days you will have fruitful discussions with positive outcomes at the end of the symposium, and at the same time foster a good networking among yourselves.

While you are here in our vibrant city of Kuala Lumpur, please spend some time to visit and explore many sights and sounds that the city has to offer. With that, it gives me great pleasure to declare THE 13TH INTERNATIONAL VTS SYMPOSIUM 2016, open.

Thank you.

ANNEX F THANKS FROM IALA BY MR FRANCIS ZACHARIAE, SECRETARY-GENERAL OF IALA

Director General Dato' Baharin Bin Dato Abdul Hamid, Symposium Participants, Ladies and Gentlemen,

I send you the warmest regards from the IALA President Mr. Juan Francisco Rebollo, who was originally planned to do this speech. Unfortunately the President had to cancel his participation due to other commitments.

Firstly I would like to thank the dignitaries and the special guests who made time in their busy schedule to be present at this symposium. It is a reflection of the importance and status of such an event and it was truly an honour to have them here.

Next I would like to thank the speakers. I don't think we all appreciate and have an understanding of the amount of time and preparation it takes in putting together the presentations that we have seen. Not only the time in preparing slides but also the month and sometimes years of research that goes into the studies that resulted in the information shared with us over the last week.

I would then also like to thank the session chairs who ran their respective sessions as a Captain sailing his ship and managing the time so strictly and effectively.

At this point I would also like to thank the Industrial Members and exhibitors. We all know what we want to achieve, but without the equipment and technology that they bring to the table we won´t be able to deliver the service expected of us. As much of the presentations and discussion have been on the subject of VTS and e-Navigation I think it is especially important to mention our industrial members because I now see a trend where the Industry is leading the innovation and way ahead in e-Navigation. A situation I have missed since the beginning of the e-Navigation story. That is good news.

Thank you very much also to the Steering Committee comprised of the IALA Secretariat with Win and Marie-Helene and Captain Halim and his team as the driving force. A special thanks to the Chairman of the VTS Committee Captain Tuncay Çehreli and the Vice Chairman Neil Trainor for all the support and guidance in the committee.

And of course, our gracious host – the Marine Department Malaysia. What an outstanding effort and execution. I am glad we had the chance to thank all of them yesterday, because we have had people around us all the time taking care of all the details. You have done an excellent job and I congratulate you with the fantastic result. I am sure this Symposium will a memorable one and a part of the history of IALA.

Lastly I would like to thank all of you, the delegates. Without your contribution this would not be a success. I noticed specifically all the good and difficult questions and the discussion that made the Symposium really valuable. This is what we call the IALA family. Friendly, technical and constructive. Thank you so much.

I will also take the opportunity – in the presence of a large number of the IALA Family – to mention, that this is R.Adm. Jean-Charles Leclair last performance in a large forum as Dean of the World-Wide Academy. Jean-Charles will retire by the end of August and be replaced by Omar Frits Eriksson. Thank you very much for all you have done for IALA and especially for the World-Wide Academy. You will be very difficult to follow. Bravo Zulu or well done as we used to say in the Navy!

Before I finish I just want to make a few commercials for upcoming IALA events.

Workshop in Qatar on providing AtoN in extremely hot climate 5-8 September 2016.

E-Navigation Underway North America in Huston 17-19 October 2016.

Risk Management Seminar, education in the Risk Management tool box in Panama 14-18 November. There is a possibility to arrive early and get a special tour of the new Panama Canal.

As always there is more info on and registration through the IALA Web site; or contact the Secretariat.

Finally I would like to wish you all a safe trip home and see you in 2020 in Rotterdam.

ANNEX G CLOSING SPEECH BY DATO' BAHARIN BIN DATO' ABDUL HAMID, DG MARINE DEPARTMENT MALAYSIA

Mr. Francis Zachariae, Secretary General International Association of Marine Aids to Navigation and Lighthouse Authorities

Captain Mohamad Halim Ahmed, Chairman of the Organizing Committee THE 13TH INTERNATIONAL VTS SYMPOSIUM 2016

Distinguished Guests, Ladies and Gentlemen,

ASSALAMUALAIKUM W.R.T W.B.T, and VERY GOOD AFTERNOON

Thank you for giving me the honour to say a few words. On behalf of Marine Department Malaysia, I would like to thanks the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) and sponsors international and local, speakers who presented papers, and of course, participants/delegates for your contributions which made this Symposium a success.

It has been a hectic 5 days of deliberations on the current challenges and opportunities in VTS and Maritime Domain Awareness with 11 technical sessions theme on the VTS operations in port/waterways, VTS and e-navigation with the emphasis on sustaining safe navigation.

Following to this, participants have had extremely fruitful and productive discussions, active exchanges of opinions and ideas and lively debate relating to provision, operation, maintenance and use of VTS.

Distinguished Guests, Ladies and Gentlemen,

I would like to reiterate what as mentioned by the Hon Deputy Minister of Transport, Malaysia on the 8 August 2016, safety of navigation for shipping has always been a primary agenda for Malaysia. Malaysia commitment remain high for maintaining safe navigation for ships with various effort and development to make our waters safe, secure and environmentally sound. Commitment reflected in the performance of availability factor of aids to navigation as laid out by IALA is part of this Key Performance Indicator (KPI) to the government. Therefore, in order to sustain this, the Light Dues Board of Peninsular Malaysia will implement several measures, as such:-

(i) Remote monitoring system for all aids to navigation;

(ii) Construction of a new buoy tender vessel;

(iii) To build 9 new VTS Centre to centralise monitoring of all VTS operation in Malaysia whether port or coastal VTS in Port Kelang. This infrastructure will not only house the latest technology in VTS and aids to navigation monitoring system but also will be manned by competent and qualified VTS personnel.

Malaysia has been a member of IALA since 1962, and Council since 2002 and continue to be active in future IALA activities Malaysia will remains committed to play an important role as an IALA member and Council Member, at the same time foster good networking among IALA Members.

Distinguished Guests, Ladies and Gentlemen,

In closing, I would like to reiterate my sincere thanks and appreciation to the organizing committee under the leadership of the Capt Muhammad Halim, IALA Secretariat, speakers, and sponsors for the successful organization of the 13th International VTS Symposium and to those who have contributed both directly and indirectly. My thanks to the distinguished participants, various organisation and agencies international and locally attending this symposium. We look forward to participating in the next International VTS Symposium to be held in Rotterdam in 2020. I hope that all participants, exhibitors, and spouses have enjoyed your stay in Kuala Lumpur for the past five days and I wish you all safe journey back home.

With that, I officially declare this 13th International VTS Symposium closed.

Thank you.

10, rue des Gaudines - 78100 Saint Germain en Laye, France
Tél. +33 (0)1 34 51 70 01- Fax +33 (0)1 34 51 82 05 - contact@iala-aism.org

www.iala-aism.org

International Association of Marine Aids to Navigation and Lighthouse Authorities
Association Internationale de Signalisation Maritime